THE AMERICAN ENERGY INITIATIVE, PART 4: H.R. ——, THE JOBS AND ENERGY PERMITTING ACT OF 2011

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND POWER

OF THE

COMMITTEE ON ENERGY AND COMMERCE

HOUSE OF REPRESENTATIVES

ONE HUNDRED TWELFTH CONGRESS

FIRST SESSION

APRIL 13, 2011

Serial No. 112–37

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THE AMERICAN ENERGY INITIATIVE, PART 4: H.R. ———, THE JOBS AND ENERGY PERMITTING ACT OF 2011

WEDNESDAY, APRIL 13, 2011

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND POWER,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittee met, pursuant to call, at 10:00 a.m., in room 2322 of the Rayburn House Office Building, Hon. Ed Whitfield (chairman of the subcommittee) presiding.

Members present: Representatives Whitfield, Shimkus, Walden, Terry, Burgess, Scalise, McMorris Rodgers, Olson, McKinley, Gardner, Pompeo, Griffith, Barton, Rush, Inslee, Green, Capps, Gonzalez, and Waxman (ex officio).

Staff present: Gary Andres, Staff Director; Charlotte Baker, Press Secretary; Anita Bradley, Senior Policy Advisor to Chairman Emeritus; Maryam Brown, Chief Counsel, Energy and Power; Garrett Golding, Legal Analyst, Energy; Cory Hicks, Policy Coordinator, Energy and Power; Ben Lieberman, Counsel, Energy and Power; Katie Novaria, Legislative Clerk; Phil Barnett, Staff Director; Alison Cassady, Senior Professional Staff Member; Greg Dotson, Energy and Environment Staff Director; Caitlin Haberman, Policy Analyst; and Alexandra Teitz, Senior Counsel, Environment and Energy.

OPENING STATEMENT OF HON. ED WHITFIELD, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF KENTUCKY

Mr. WHITFIELD. It is 10 o'clock and I am going to call this hearing to order. This is our fourth in a series of hearings on our American Energy Initiative, and that initiative is designed to explore obstacles to helping America become independent on its energy needs, both for transportation and also relating to the production of electricity. Our goal is try to find and locate and identify obstacles to that independence and then try to take actions to deal with it.

In addition to identifying obstacles, we are also trying to be proactive in ways to make it easier for production of domestic resources. Today, this hearing focuses on one part of this initiative, and that is the Jobs and Energy Permitting Act of 2011, which has been released in the form of a discussion draft by the gentleman from Colorado, Mr. Gardner.

[The information appears at the conclusion of the hearing.]

I would just say that this came about because we identified a problem off the coast of Alaska in which a company trying to do exploration has been involved in a process that has taken over 5 years to obtain a permit. And that was precisely the purpose of our hearings on American Energy Initiative is to, as I said, locate those obstacles, identify those obstacles, and then try to deal with it.

So at this time I would like to yield to the gentleman from Colorado for a more thorough explanation of his discussion draft.

[The prepared statement of Mr. Whitfield follows:]

PREPARED STATEMENT OF HON. ED WHITFIELD

The hearing is called to order. This is our 4th in a series of hearings on the American Energy Initiative, which seeks to comprehensively address high gasoline prices and other energy challenges facing the nation. Today's hearing focuses on one part of the American Energy Initiative, the "Jobs and Energy Permitting Act of 2011," which has been released in the form of a discussion draft by the gentleman from Colorado, Mr. Gardner.

The overall goal of the American Energy Initiative is to best utilize all the tools available to us to address our energy challenges. First and foremost, that means increasing production of domestic energy, and the subject of the Jobs and Energy Permitting Act is the state with far and away the greatest untapped domestic oil potential—Alaska. The estimates of available oil there are very promising. In fact, it could replace ALL of our imports from Saudi Arabia.

But the federal red tape preventing that potential from being realized poses a daunting challenge. The discussion draft seeks to streamline the red tape and bring that oil online in the years ahead. That it has taken one energy producer over 5 years to get a Clean Air Permit in the OCS is unprecedented, even for EPA.

The benefits of accessing Alaskan oil would be substantial. More Alaskan oil would mean lower future prices at the pump as well as reduced reliance on imports from unstable and unfriendly countries. That alone is ample reason to move forward, but increased Alaskan production would have the added benefit of creating tens of thousands of well paying energy industry jobs. It would also provide billions in federal, state, and local revenues—and do so without raising taxes.

Expanded domestic oil production is strongly supported by the American people, but as we will learn, it is even more strongly supported by the Alaskan people, including those who live in the North Slope closest to where most of the new production would occur. We ought to listen to the Alaskan people, rather than lecture to them.

Alaskans care about the environment, and they will insist that energy production leave as light a footprint on their state as is possible.

The state of Alaska wants to make a major contribution to solving the energy problems the nation faces, and the Jobs and Energy Permitting Act of 2011 ensures that they are not prevented from doing so.

I yield the balance of my time to Mr. Gardner.

OPENING STATEMENT OF HON. CORY GARDNER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF COLORADO

Mr. GARDNER. Thank you, Mr. Chairman. Thank you for the hearing today. I look forward to working with you and other members of the committee. And thank you to the witnesses that will be testifying today.

I come from an energy-producing State and I have had the privilege of collaborating with many colleagues from other such States in a project that are calling the American Energy Initiative. Of course, there are significant regional differences. The oil and gas industry in the Rockies faces different technical, economic, and legal challenges than oil and gas in the Gulf of Mexico or elsewhere. And coal production in Colorado and other Western States has both similarities and differences with our Appalachian counterparts.

But whichever energy-producing State we come from, one thing that we all having in common is that the Federal Government is holding us back from meeting our potential to produce more domestic energy. Changing that is going to be a big part of the American Energy Initiative.

This is our fourth multi-day hearing on the American Energy Initiative and today we are going to focus on offshore oil and gas production and especially streamlining the process of offshore permitting. These impediments have already delayed activities in the Beaufort Sea off of Alaska's North Slope where exploration has yet to even begin on leases that were signed over 5 years ago. The Jobs and Energy Permitting Act of 2011 discussion draft seeks to address current problems in EPA's offshore permitting requirements.

Offshore Alaska holds tremendous potential but not if we allow the status quo to continue. Production in the arctic OCS could provide a million barrels of oil a day, comparable to what we currently get from Saudi Arabia. But unlike Saudi Arabia, this domestic production is blocked by a convoluted permitting system in place that is difficult, if not impossible, to navigate. The fact that the owner of the leases had already secured something like 35 permits but could not start drilling because it could not get the 36th would be funny if not for the adverse consequences in lost domestic energy and lost jobs.

Keep in mind we are not talking about an area the Federal Government has placed off-limits to energy leasing, of which there are far too many. We are talking about an area that was already leased but for which the lease is essentially being nullified with red tape. That needs to change.

The current anti-domestic-energy philosophy is not what the American people want. No matter how many times President Obama insists that America doesn't have enough domestic oil to make any difference, the public isn't buying it. They want our oil supplies unlocked and understand full well the benefits of doing so. They see the impact that production has in their communities in the jobs it brings. This bill alone has the potential to create 40,000 to 50,000 jobs annually and $75 billion in payroll. And we are not just talking about jobs and income in Alaska. Increased oil production in Alaska will result in jobs across the United States.

One thing I can attest to is that a majority of Coloradans support increased energy production in the State. Yes, we expect strong environmental safeguards, but we don't want those safeguards to be exploited by activists into an excuse to shut the energy industry down.

Coloradans are proud to live in a State that produces energy for the rest of the Nation and recognizes the benefits in terms of high-paying jobs, as well as state and local revenues. And as we will soon here, that sentiment is true of native Alaskans as it is of native Coloradans. In fact, there are very few elected officials from Alaska who support the existing constraints on energy production there.

We have a great panel, including some who came from very far away to be here and who booked their flights in the midst of a potential government shutdown. So we really, truly appreciate your time to be here today. And I look forward to learning more about Alaska's energy situation and what we in Congress can do to improve it. Thank you very much for the opportunity to hear this bill today and for your work and testimony today.

Mr. WHITFIELD. Thank you, Mr. Gardner. At this time, Mr. Rush, you are recognized for 5 minutes.

OPENING STATEMENT OF HON. BOBBY L. RUSH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

Mr. RUSH. I want to thank you, Mr. Chairman, and I want to thank all of the guests who are going to be with us today.

Mr. Chairman, today we hear testimony regarding the discussion draft of the so-called Jobs and Energy Permitting Act of 2011. This will amend Section 328 of the Clean Air Act that addresses air pollution from Outer Continental Shelf drilling activities. While I have some reservations about the bill as written, my biggest concern with today's hearing is that we will not have the opportunity to hear from representatives from the Environmental Protection Agency. As I am told, they were not given sufficient advanced notice in order to appear before us today. And I find it very troubling that we are here to discuss amending sections of the Clean Air Act without the benefit of having EPA's expertise to help guide and inform our decision.

As you know, Mr. Chairman, Ranking Member Waxman and I wrote you a letter and Chairman Upton on Friday asking you to postpone this hearing until we could have the appropriate representatives from EPA to testify before us. And I am surely disappointed that this reasonable request could not be met since this bill would make significant changes to the Clean Air Act, rules that EPA is in charge of implementing. I only hope that as this discussion draft moves through the legislative process that we will get a chance to hear from EPA directly at any future hearing scheduled on this bill in order to help inform the final product.

As far as the discussion draft itself is concerned, one of my main concerns deals with expediting the permitting process, which may limit the opportunities for review as well as public input. While I am not necessarily against streamlining the permitting process in general, I want to make sure that we are giving local communities adequate time to comment on proposed permits before they are enacted.

Another concern deals with shifting the judicial review away from the Environmental Appeals Board, which has almost 20 years of experience in the highly technical area of preventing of significant deterioration or PDS permits that moving the process to D.C. Circuit Court of Appeals, which lacks any of this technical expertise. Requiring local stakeholders to travel all the way to Washington, D.C., in order to raise concerns about local air quality impacts could prove to be overly costly and also burdensome if not outright impossible for less well-to-do communities.

Finally, I look forward to hearing more discussion regarding the application of emissions control requirements under the new Convention of Significant Deterioration, CSD program of the Clean Air Act. Other than the proposed legislation, support vessels such as ice riggers and oil spill response vessels, which may contribute a majority of the air pollution associated with drilling activities, would not be subject to best available control technology emission reduction requirements or other requirements adopted under the CSD program. I would like a better understanding of how this would impact air quality for our local communities.

So I look forward to today's hearing and I look forward to hearing all of our witnesses today in order to get a better understanding of how this proposed legislation would impact local stakeholders, as well as how it would benefit oil and gas companies conducting the drilling in the Outer Continental Shelf. Mr. Chairman, I yield the balance of my time to the ranking member if he wants my time and his time as well. If anybody else is wanting some time? OK. I yield back the balance of my time.

Mr. WHITFIELD. Mr. Rush, I would just make one comment. We did invite EPA representatives to attend today's hearing and Friday's hearing. They have refused to come. I believe they have a lot of qualified people over there and maybe just because Gina McCarthy was unable to come, I know they have enough qualified people to come and attend these hearings. We, as you know, have a full schedule of hearings. We intend to move a lot of legislation, and we are not going to allow EPA to dictate our schedule.

At this time I recognize the gentleman from——

Mr. RUSH. Mr. Chairman, if I may respond?

Mr. WHITFIELD. Yes.

Mr. RUSH. I think that it is reasonable that the EPA should be given adequate notice. Now, I just don't think that we can continue just to barrel through this without EPA given adequate notice and I think that is reasonable.

Mr. WHITFIELD. I think we did give them adequate notice and hopefully they will come to our next hearing.

At this time I will recognize the gentleman from Texas for 5 minutes.

Mr. BARTON. I thank the gentleman. You know, I don't think it takes a rocket scientist to understand we are reviewing a lot of things that the EPA is involved in, with all due respect to my good friend Mr. Rush. It is a 3-minute cab ride from the EPA building. It is a 10-second phone call. And if they don't know that they are going to be called to testify before this subcommittee and this full committee numerous times in the next 2 years, they need to take an IQ test because they are going to be called. And if Mr. Waxman and Mr. Rush needs to let them know that, if they don't understand what Mr. Whitfield and Mr. Upton are saying, maybe we are not saying it in the right way or the right tone, but it is no surprise that we are going to be asking the EPA to come and justify or at least give their comments on some of the things that we are doing.

Well, I am very glad to see my good friend Mr. Young. We have a tremendous expert here in Congress and a former chairman of two committees and we know he is an expert on Alaska. And after he does whatever he does he will be back.

Mr. RUSH. He better hurry up because we have got a lot of business to take care of.

OPENING STATEMENT OF HON. JOE BARTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. BARTON. This hearing, Mr. Chairman, is going to be a revelation to the country, I believe, when they find out what the EPA has not done up in Alaska. We have tremendous oil and gas potential in the Outer Continental Shelf. And under the Clean Air Act, the EPA, unlike the Gulf of Mexico, has the right to give some of these permits. When you hear some of the representatives from some of the industry testify later in today, I think panel members are going to be stunned that the reason these permits haven't been given is because they can't decide whether it is a stationary source or a mobile source because it is a drilling ship, not a drilling platform. They can't decide where to measure air quality, whether they measure it at the side of the ship, onshore, or someplace in between. It is the most bureaucratic gobbledygook I have ever encountered. You know, there is absolutely no question that the EPA has the authority but just because you have the authority doesn't give you the opportunity just to sit on your hands and think of one bureaucratic excuse after another to not make a decision. And that is, I believe, what we are going to find today.

We need to have a responsible drilling program. The President himself with respect to this particular area of our country stated in his blueprint for secure energy future on March the 30th that the administration remains committed to facilitating development in this region, which will require consideration across the Federal Government. He went on to state that a cross-agency team would be created to coordinate and facilitate efficient offshore permitting.

So I am going to yield the balance of my time to Mr. Shimkus. But this hearing is one that we really need to pay attention to because of the huge potential we have for domestic oil and gas production in the OCS off the coast of Alaska.

And with that I yield the balance of my time to Mr. Shimkus.

Mr. SHIMKUS. Thank you, Mr. Barton.

OPENING STATEMENT OF HON. JOHN SHIMKUS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

America is one of the few countries that sees its natural resources as a hindrance, not as a national advantage. We have said this numerous times, and as gas prices go up, we have to make sure we fully use our natural resources.

I know about Alaska and I know about jobs. My late father-in-law worked on the Alaskan pipeline. He was a microwave communication engineer. He flew the pipeline. He was one of many people who came up from the lower 48 to get good-paying jobs and raised a family of three. So fossil fuel energy development is job creation in an economy that needs jobs.

And I will end on this. There are over 17,000 employees in the Environmental Protection Agency. Seventeen thousand. Surely, one of them could have come to the hearing, I would imagine. Maybe one could have come to the hearing and all of the other hearings we are going to be holding in the future.

Mr. RUSH. Will the gentleman yield?

Mr. SHIMKUS. I would be happy to yield.

Mr. RUSH. I understand that the janitor is available. And he said——

Mr. SHIMKUS. Well, for some of us maybe the janitor would give better testimony than some of the career bureaucrats they have in the EPA. I yield back.

Mr. WHITFIELD. The gentleman from California, Mr. Waxman, is recognized for 5 minutes.

OPENING STATEMENT OF HON. HENRY A. WAXMAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. WAXMAN. Mr. Chairman, today's hearing examines legislation to amend the Clean Air Act provisions that protect air quality when offshore oil and gas are developed. I hope we can reach agreement on this legislation but I cannot support it in its current form.

This legislation is being considered at the behest of a single company in response to two permit applications in Alaska, yet would apply broadly to the East and West Coast and part of the coast of Florida. Here, Shell has identified an area where the statute is ambiguous. As a result, permits are delayed while EPA, the stakeholders, and the Environmental Appeals Board work to resolve these issues. I believe it would be appropriate for this committee to provide clarity on these matters. I hope we can work together to develop legislative language that would resolve those issues in an appropriate and targeted manner.

But as we provide clarity, we must also realize these are large industrial facilities located off-coast where people live and in waters where people fish and whale. Shell's Discover operation emits more pollution than a 1,000-megawatt natural gas power plant and almost as much as a new oil refinery. Our goal should be to resolve this issue without sacrificing air quality. Shell has also raised concerns about the length of time of the permitting process. This is also an area where it is critical to strike the proper balance.

The Clean Air Act has always provided for extensive and open stakeholder input to EPA's decision making. This is an essential principle of the law. It ensures that the government is responsible to citizens who want clean air and to industry, which wants to conduct activities that emit air pollution. While Shell has raised legitimate concerns about the permit process, the language before us goes too far. It eliminates the opportunity for any administrative review of EPA decisions except for a narrow exception that would apply only to the permit application. It moves all judicial appeals from the regional circuit courts of appeals to the D.C. circuit, and it requires EPA to issue final permits in 6 months, which will limit the time for public comment and may preclude the EPA from developing the record necessary to support its final decisions in court.

One effect of these changes would be to make it much more difficult for local citizens who are directly affected by air pollution from a project to raise concerns requiring Alaskans to fly to Washington, D.C. To challenge a permit decision is a real burden. Eliminating administrative reviews creates an additional hurdle for citizens. Administrative reviews are faster, less formal, don't impose fees, don't require a lawyer, and are often conducted by videoconferencing. They also do not allow participants to recover attorney's fees.

I am also concerned about how this proposal will affect California and other States. In California, EPA has delegated the authority to issue permits for offshore oil and gas activities to local air pollution control agencies. The changes in this bill would override state and local interpretations, laws, and regulations that California has adopted to help meet its severe air pollution problems. It would also remove all appeals of California's permits from state hearing boards and state courts to the D.C. circuit. This is a significant infringement of local control over local air pollution matters.

I want to close with a comment on process. I am disappointed that EPA is not present to testify today. If we are going to reach consensus, we are going to need the input of the Agency experts, as well as witnesses from California and other affected areas. Chairman Whitfield has today rejected our request. His position appears to us that it is reasonable to give the Agency just a few days' notice and expect EPA to be able to send a witness to the hearing today. I understand Gina McCarthy is testifying today on a legislative matter before another committee. That is not fair. That is not how we treated administration witnesses in prior Congresses. For that reason, the Democrats on the committee are invoking our rights under Rule 11 to request a minority day of hearings. I believe scheduling our requested hearing will help the committee produce balanced legislation that achieves its stated goal and has a chance of enactment. I look forward to what the witnesses have to say. And we will withdraw that petition, Mr. Chairman. You indicated you will have EPA at other hearings. I didn't know if you meant other hearings on this bill or other hearings on other bills. But on this bill we do want EPA, we do want other witnesses to be able to testify, and we are giving you that Rule 11.

Mr. WHITFIELD. Thank you, Mr. Waxman. At this time I would like to introduce the first panel.

Mr. RUSH. Mr. Chairman, if I might before we hear the first panel, Mr. Shimkus has just shared with me an email that he received. The husband of our former member Jane Harman, Sidney, passed a few moments ago earlier and I was just wanting to inform all the members of the subcommittee and also inviting them to keep the Harman family in their prayers.

Mr. WHITFIELD. Thank you, Mr. Rush, and thank you, Mr. Shimkus, for letting us know about that.

We are delighted to have these elected representatives on our first panel. They really do not need any introduction but Representative Don Young from the State of Alaska, Senator Lisa Murkowski from the State of Alaska, and Senator Mark Begich from the State of Alaska. We know that that State is certainly impacted by decisions or lack of decisions made by EPA on air quality permits.

And at this time, Mr. Young, I would like to recognize you for 5 minutes for your opening statement.

Mr. YOUNG. Mr. Chairman, if I could, I would like to go down the seniority rule. I am the senior member but we do have two Senators here and they have lots of things to do on the other side. So at this time I would like to recognize Senator Murkowski, the senior Senator from that side, and I would yield to her and then I will take my time when she finishes.

Mr. WHITFIELD. Well, Mr. Young, you are being so kind today, which we appreciate.

Mr. YOUNG. If you take a look at my eyes, you know I am being kind.

Mr. WHITFIELD. Well, Senator Murkowski, I will recognize you for 5 minutes.

STATEMENTS OF HON. LISA MURKOWSKI, A UNITED STATES SENATOR FROM THE STATE OF ALASKA; HON. MARK BEGICH, A UNITED STATES SENATOR FROM THE STATE OF ALASKA; AND HON. DON YOUNG, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ALASKA

STATEMENT OF HON. LISA MURKOWSKI

Ms. MURKOWSKI. Thank you, Mr. Chairman, and I thank my colleague, Congressman Young. We are not going to suggest how many fights you get in on behalf of the State of Alaska, but you are playing the role here today.

Mr. WHITFIELD. Do you have your microphone on, Senator?

Ms. MURKOWSKI. Maybe I just need it a little bit closer. Is that better? Thank you, Mr. Chairman, and ladies and gentleman, thank you for your attention to this issue this morning. The fact that you have the full Alaska delegation represented here today, Republicans, Democrats, House and Senate together to testify on this issue I think speaks to the significance and the importance of this to those of us in Alaska.

Congressman Young has recognized me as the senior Senator, but I am also the ranking member of the Senate Committee on Energy and Natural Resources, as well as the ranking member on the Appropriations Subcommittee on Interior and the Environment. So we have been paying, of course, particular attention to this issue on the Senate side.

You are going to hear some good testimony here today. But I think one of the most critical pieces that you will hear is the fact that America's most critical piece of infrastructure, the Trans-Alaska Pipeline, is now less than 1/3 full. The tremendous resources that are beneath Alaska's OCS could help us fill up that pipeline, slash America's dependence on foreign oil, create new jobs, and generate new government revenues at a time when we are all seeking those. And yet despite these much-needed benefits, even exploration has been blocked because of the EPA's continued inability—or perhaps simple unwillingness—to issue valid air permits.

You are going to hear the specifics of EPA's failure to comply with both the intent of the Clean Air Act and with Congress' directive in the fiscal year 2010 Interior and EPA Appropriations bills. And I will simply say right at the outset it doesn't really matter what your opinion is about offshore oil or gas development, in the Arctic or elsewhere, it is absolutely indefensible—indefensible—for a permit application to take 6 years—6 years—when the EPA Administrator has testified, as she did in my Appropriations subcommittee, that there is no anticipated human health risk that is at issue. She has stated full out there is no human health risk here. So it has been 6 years and counting, Mr. Chairman, despite no anticipated risk.

I would also suggest to the members of this committee that it is likewise indefensible to allow the EPA's failure to serve as a de facto veto over the national energy security interests of the Outer Continental Shelf. The OCS Lands Act assigns the Interior Department with the mission of the expeditious development of energy resources—and those resources belong to the American people, not to any corporation and certainly not any federal agency. It cannot be the EPA's decision, nor their Environmental Appeals Board's decision, that determines whether Americans benefit from their holdings in the OCS.

The EPA's core competencies are supposed to involve both an understanding of human health impacts and a command of air quality permitting regimes so that a regulated operation—be it a power plant, a factory, a drilling rig—can have a level of reasonable expectation about the timing of their application, especially when there is no human health risk at issue. Instead, we are witnessing core incompetency. The air permitting process has been confused and really taken advantage of by those who have found the Clean Air Act to be less of an air quality statute and more of a hidden, blunt instrument that can be used to stop energy exploration.

This is no longer a matter of understanding the process better or taking even greater steps to ensure air quality concerns are addressed. If the EAB cannot accept a permit that took this long and this much accommodation to issue, then EAB has no place in the process. And likewise, if the EPA can't demonstrate some competency, especially as congressional urging and intent becomes more clear, then EPA should not expect to keep its authority for long.

Mr. Chairman, members of the committee, I am grateful for the opportunity to testify to you, with you this morning. I do note the discussion going back and forth about the invitation to EPA to testify. I think it is an important issue and that EPA should be involved and I think clearly an invitation to come and sit before you and provide that information is important. I will remind you, however, that given the very busy schedule that we have on the other side, Senator Begich and I were able to clear the decks, but I think just about a day-and-a-half notice. This is important to us. I would think that the EPA would think it is important to them as well. Thank you.

[The prepared statement of Ms. Murkowski follows:]

PREPARED STATEMENT OF HON. LISA MURKOWSKI

Chairman Upton, Ranking Member Waxman, and distinguished members of the Committee, thank you for the invitation to testify today about outer Continental Shelf air quality issues. As the Ranking Member of the Senate Committee on Energy and Natural Resources, the Ranking Member of the Appropriations Subcommittee on Interior and the Environment, and above all the Senior Senator for the State of Alaska, my interest in this issue could not be greater.

You are all by now aware that one of America's most critical pieces of infrastructure, the Trans Alaska Pipeline, is now less than one-third full. The tremendous resources beneath Alaska's OCS could help refill that pipeline, slash America's dependence on foreign oil, create new jobs, and generate new government revenues. Yet despite these much-needed benefits, even exploration has been blocked because of the Environmental Protection Agency's continued inability - or simple unwillingness - to issue valid air permits.

My fellow witnesses will testify to the specifics of EPA's failure to comply with both the intent of the Clean Air Act and with Congress' directive in the Fiscal Year 2010 Interior and EPA Appropriations bill. I will simply say at the outset that no matter what anyone's opinion is about offshore oil and gas development, in the Arctic or elsewhere, it is indefensible for a permit application to take six years when the EPA Administrator has testified, as she did in my Appropriations subcommittee, that there is no anticipated human health risk at issue. That's six years and counting, Mr. Chairman, despite no anticipated risk.

I would also suggest to the members of this committee that it is likewise indefensible to allow the EPA's failures to serve as a de-facto veto over the national energy security interests of the outer Continental Shelf. The Outer Continental Shelf Lands Act assigns the Interior Department with the mission of the expeditious development of energy resources - and those resources belong to the American people, not any corporation and certainly not any federal agency. It cannot be the EPA's decision, nor their Environmental Appeals Board's decision, that determines whether Americans benefit from their holdings in the OCS.

The EPA's core competencies are supposed to involve both an understanding of human health impacts and a command of air quality permitting regimes so that a regulated operation - be it a power plant, a factory, or a drilling rig - can have a level of reasonable expectation about the timing of their application, especially when there's no human health risk at issue. Instead, we're witnessing core incompetency. The air permitting process has been confused and really taken advantage of by those who have found the Clean Air Act to be less of an air quality statute and more of a hidden, blunt instrument that can be used to stop energy exploration.

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Mr. Chairman and members of this committee, I am grateful for the opportunity to testify before you. Chairman Upton, I thank you for your engagement on this important issue. This is an area where Congress can act - and I believe must act - to considerably improve our nation's energy policy.

Mr. WHITFIELD. Thank you, Senator Murkowski. Senator Begich, you are recognized for 5 minutes.

STATEMENT OF HON. MARK BEGICH

Mr. BEGICH. Thank you very much, Chairman Whitfield, and Ranking Member Rush, and the members of the subcommittee. Thank you for the opportunity to cross the Capitol to testify today and congratulations on pursuing the American Energy Initiative.

As our economy regains steam from the worst economic crisis since the Great Depression, developing America's energy resources for Americans and by Americans is a vital part of our recovery. About a month ago, President Obama proposed essentially that when he called for an increased domestic oil and gas development and cutting foreign oil imports by a third by 2025. The President even said his administration was "looking at potential new developments in Alaska both onshore and offshore." We Alaskans were glad to hear the President use the word "Alaska." As American's energy storehouse for better than a quarter of a century, we are anxious to continue supplying our Nation a stable source of energy, just as we have done since the oil starting to flow through the Trans-Alaska Pipeline in 1977.

Simply put, Alaska has enormous untapped oil and gas reserves, an estimated 40 to 60 billion barrels of oil on state and federal lands and waters. That is approaching a decade's worth of U.S.

consumption. And we also hold the Nation's largest conventional natural gas reserves, more than 100 trillion cubic feet of this clean-burning fuel. There is no way you can do an energy plan without Alaska being a part of it for our economic security and our national security.

As is always the case, it is the details that matter. While we welcome the President's interest in increased energy development in our State, his administration—and those which preceded him—have enacted roadblocks to this laudable goal. I know the hearing today focuses on offshore activity, but the problem is widespread. In the National Petroleum Reserve-Alaska, ConocoPhillips has been working for years to secure a permit to build a bridge into a petroleum reserve to develop oil only to be stalled by the Army Corps of Engineers and EPA.

In the offshore, Shell has been working for 5 years and now approaching 6 years, invested more than $3 billion for the opportunity to drill exploratory wells in Alaska's Chukchi Sea. They have gotten very close last year, but just when it appeared the development had the green light a few weeks ago, an internal EPA Environmental Appeals Board sent the air quality permit back to the drawing board.

Mr. Chairman, I have to confess that I haven't studied your bill closely. But I do endorse the call for a change. Business as usual simply isn't working when it comes to increased oil and gas development in my State. That is why I recently offered two relevant proposals to change.

First, creation of a federal coordinator for the Arctic OCS. This would be modeled after legislation the late Senator Ted Stevens passed establishing a federal gas pipeline coordinator. This office would have authority to work across the agencies causing Alaska so much heartburn today—the EPA, Army Corps of Engineers, and the Interior Department. The federal OCS coordinator would work with the State of Alaska and affected local governments to streamline development in the Chukchi and Beaufort seas, which hold such promise for the future of oil and gas development for our State and for this country.

Second, I would suggest, along with my colleague Senator Murkowski, that legislation to transfer the authority to regulate air quality in OCS oil and gas development off Alaska from EPA to the Interior Department, as is done in the Gulf of Mexico. Your legislation appears to make the EPA process work more like the Interior Department. Either way, we need to get to a place where one agency is in charge, where the process is the same across the country, and where people who invest time and money get a result on a reasonable time frame.

Thank you for your efforts. As you see today, this is a combined effort by our delegation that Alaska oil and gas development is critical to our national energy portfolio, our national security, and our economic security. So we are just honored to be here. Thank you, Mr. Chairman.

[The prepared statement of Mr. Begich follows:]

PREPARED STATEMENT OF HON. MARK BEGICH

Chairman Whitfield, ranking member Rush and members of the subcommittee.

Thank you for the opportunity to cross the Capitol to testify today. And congratulations for pursuing the American Energy Initiative.

As our economy regains steam from the worst economic crisis since the Great Depression, developing America's energy resources for Americans and by Americans is a vital part of our recovery.

About a month ago, President Obama proposed essentially that when he called for increased domestic oil and gas development and cutting foreign oil imports by a third by 2025.

The President even said his administration is - quote - ″looking at potential new development in Alaska, both onshore and offshore.″

We Alaskans were glad to hear the President use the ″A″ word: Alaska. As America's energy storehouse for better than a quarter century, we are anxious to continue supplying our nation a stable source of energy just as we have been doing since oil starting flowing through the trans-Alaska pipeline in 1977.

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The federal OCS coordinator would work with the State of Alaska and affected local governments to streamline development in the Chukchi and Beaufort seas, which hold such promise for future oil and gas development.

Second, I suggested legislation to transfer the authority to regulate air quality in OCS oil and gas development off Alaska from EPA to the Interior Department, as is done in the Gulf of Mexico. Your legislation appears to make the EPA process work like what Interior does now.

Either way, we need to get to a place where one agency is in charge, where the process is the same across the country and where people who invest time and money get a result on a reasonable time frame.

Thank you for your efforts and as you see today, these are ideas that almost all of our state can get behind.

Thank you, Mr. Chairman, for this opportunity.

Mr. WHITFIELD. Senator Begich, thanks so much for your testimony. Now, Mr. Young.

STATEMENT OF HON. DON YOUNG

Mr. YOUNG. Mr. Chairman, much has been said in my statement by the two Senators and I won't repeat it. I ask unanimous consent to submit it for the record. Mr. Chairman, they both put out the information. 5 years we have been waiting for a permit. We did get a permit from EPA. Then the Appeals Board turned it down. In the continuing resolution we passed earlier on this year, we took away the authority of the Appeals Board to do so. And I think that is important because we have gone through this. And really it is all about a ship. And this ship has put millions of dollars to make sure that they have clean air. And the EPA finally declared that they did have clean air and yet the Appeals Board, on an interest group, turned down the permit, another 5 years.

But I want to go back to the concept of this Nation and where we are today. I think you may have read the paper today on the cost of fuel. And it will affect the economy. And by the way, the people in Chicago is about 4.36 a gallon now. It will be $5 by the 1st of July. Now, that does stifle this economy. And some people say we have to get off of fossil fuel economy. But the meantime I saw my President go down to Brazil and say we are going to be your partners. We are going to buy your oil. Now, that doesn't make sense to me. Never has made sense to me when we spend billions of dollars to send money overseas, taking jobs away from Americans and making us more dependent upon foreign countries to run our economy. You can't do that.

We have a big budget battle going on right now. That budget battle has really been caused by the lack of being able to develop our fossil fuels. And by the way, don't buy this concept there is any shortage of fossil fuels. If you read the science, we have as much fossil fuels as most of the foreign countries do, and especially in Alaska. We figure there is 27 billion barrels of oil in Chukchi alone, probably 10 billion in Beaufort Sea. That is a tremendous amount of oil.

Now, I am not talking about Florida. I am not talking about California, West Virginia, or any other State. I am talking about Alaska alone with a pipeline right now is 1/3. Fort Greely got shut down this last winter. It got shut down because we had a small spill that was controlled by the way the line was developed. And we were able to take and restart it.

And by the way, you talk about the EPA. That is an Agency that has run amok. They arrived there in Alaska and tried to tell the State that they were going to take control, that it was their responsibility, and we could not start the pipeline without their oK. If it had been stuck down 2 more days, it would have frozen that pipeline. The oil would not flow. And that is 12 percent of our economy today, our oil production today in the United States. It was at one time 25 percent.

So I am suggesting your legislation is long overdue. You know, the EPA is an agency right now that thinks that they can thumb their nose at you—I didn't thumb my nose at you—and not answer questions. They should be here. Now, I can't quite understand that. Like you say 17,000 employees and they couldn't—send a janitor down. I think it would be a good idea. Because what they say—don't you even touch this. We are now the authority. We are now the Government of the United States and don't you even question us. This so-called oilfield is 70 miles offshore and we are really talking about a rig, a drill ship, one ship which they put all the efforts into it to make sure that it got clean air. And to have an agency say no, national security doesn't count. We are worried about the inhabitants, and by the way, the inhabitants, you are going to hear testimony later from one of them.

But I communicate and I represent that whole State. There are two Senators, one Congressman. And you will find out they worked very hard—Shell has worked very hard with Point Barrow and the others for committing in those areas and in fact they have an agreement working together with the local communities.

Now, of course, you are going to have dissent. We know that. Dissent usually fueled by outside interests. And we know that, too. We will fight this battle. And by the way, I am the only person in this room that had the pipeline built in 1973. We passed that legislation out of Congress. Whatever we have to do in this Congress, if we want energy independence, we have to have that one provision I put in that bill, and that is a provision there shall be no lawsuits by interest groups to stop a project in the name of national security.

And we did that. We built that pipeline in 3 years. It is one of the greatest wonders of human construction that has ever been seen and has worked beautifully through earthquakes and other activities. It can be done, but we have to get oil back in that pipeline. And one way we can do it is through your legislation. Thank you, Mr. Chairman.

[The prepared statement of Mr. Young follows:]

PREPARED STATEMENT OF HON. DON YOUNG

Chairman Whitfield and Ranking Member Rush, thank you for holding this hearing and giving me this opportunity to testify.

Since 2005, companies have spent $4 billion dollars and acquired 680 leases off the Arctic coast of Alaska but have been unable to drill them, not because of safety or environmental reasons, but due to the federal government's inability or unwillingness to issue them.

But through all of this, the primary problem has been EPA's inability to issue an adequate air permit for a drill ship that would operate for a maximum of 120 days in an offshore area approximately 70 miles from the closest humans.

The Federal government's inability to issue viable permits to drill offshore Alaska is keeping resources and domestic jobs from the American people.

EPA's failure has jeopardized tens of thousands of high-paying jobs, and threatened the long-term viability of the Trans Alaska Pipeline System and our Nation's energy security during a time of high energy prices and unrest in many energy producing countries.

USGS estimates that the Chukchi alone holds 27 billion barrels of oil and 132 trillion cubic feet of gas. In comparison, when Prudhoe Bay was discovered, there was only expected to be 10 billion barrels. 16 billion barrels later, Prudhoe Bay is still in development.

However, development opportunities on state lands are rapidly decreasing, and the Trans Alaska Pipeline is running at one-third capacity. At much lower throughputs, the pipeline will not be able to operate safely or economically.

Recently, Alaska's Governor issued a goal of reaching 1 million barrels a day of throughput in TAPS. Without the federal government's support, this will be hard to meet. The Jobs and Energy Permitting Act represents a positive step towards securing an American energy future, reaching the goals of deficit reduction, and providing well-paying American jobs here at home.

Mr. WHITFIELD. Thank you, Mr. Young. And I want to thank all of you for taking time today. I know that you do have very busy schedules and we appreciate your testifying on this important subject matter.

Senator Begich, you made a comment which I certainly agree with and that is that there should be one agency responsible for issuing these permits. And I would ask Senator Murkowski, do you agree with that or not?

Ms. MURKOWSKI. I don't know that I would agree with that if the agency is the EPA. The EPA has demonstrated a level—the word that I used in my testimony was incompetency in this. When you have the administrator of the EPA admit in open record that, in fact, there is no human health risk and could not defend the fact that it has taken over 5 years to issue an air quality permit, then I would suggest to you that we need to figure out a way that we have a process that works. Look to how the process works down in the Gulf of Mexico where the Department of Interior—through MMS or now BOEMRE—has worked to facilitate it. They have figured it out. It is 45 days on average to issue a permit there, 5 years plus by the EPA. So it is not just making sure that there is one agency in charge but that there is an agency that has a competency to issue these permits.

Mr. WHITFIELD. Well, that is a good comment. I certainly agree with that. And I find it interesting that we are in this situation where we got Department of Interior issuing these permits in the Gulf and EPA everywhere else on the Outer Continental Shelf. And the fact that on the average it has taken Department of Interior 45 days, we do need an expedite process and I believe that they can make those decisions certainly in a quicker way than 6 years.

One of the things that is disturbing me is that President Obama talks a lot about energy independence and yet I get the clear impression that his Cabinet officials, particularly the EPA, are doing the direct opposite of what he is saying. He talks a lot about green energy and we know that somewhere down the road green energy is going to play a major role in producing energy in America, but it is not there yet. And as Mr. Young said, we have so much fossil fuel in this country that this administration is doing everything possible to make it more expensive to burn fossil fuel. Even the Secretary of Energy made that comment. He said that gasoline prices should be more like what they are in Europe. So do you get the sense that EPA, with this administrator, is a serious obstacle to America becoming independent on fuel issues? Yes, sir?

Mr. BEGICH. I would like to respond. I think there is a disconnect from what the President says and what the agencies are doing. I mean, you know, an example that we just gave on the 5 years to get a permit, they are halfway through their lease. So they have less than 5 years to perform on that lease. So the economics of it now become even more difficult. And if you think about the whole issue of are we going to become less dependent on foreign oil of countries that are not our friends—and there is plenty of them that we are buying from—the only way you do that is you have to develop domestically. You know, that is why I made the comments that I heard him say "Alaska," which we are very happy he said it. The question is will the agencies perform on that directive or that statement? And so far that has not been the case, at least in my limited 2 years here in the Senate.

Mr. WHITFIELD. Yes, Senator Murkowski?

Ms. MURKOWSKI. Mr. Chairman, you ask a very pertinent, very important question, and I would agree with my colleague that in fact the agencies are acting as an impediment to how we truly gain not only energy independence, but when we talk about national security interest, it is so integrally tied and related to energy.

Congressman Young has mentioned the rising price of gas at the pump and all of our constituents are coming to us and saying what can you do to decrease that price, to lower the price? There is not a lot that we can do right here today to bring it back down below $3 from where we are right now. But there are some things that this President and this administration can do to keep the prices from going up. We might not be able to get them to go down, but let us keep them from going up.

And what we are seeing right now with this level of agency kind of pile-on if you will, it is keeping us from doing what we need to do as a Nation to gain our own energy independence through increased domestic production. And whether it is the EPA regulations as they relate to emissions, whether it is the failure to advance a permit for a bridge so that we can access oil on the National Petroleum Reserve, these are agency decisions that are cutting off our ability for energy independence and raising the prices of energy to Americans all over the country, not just in Alaska.

Mr. WHITFIELD. It is my understanding that this platform out in the Beaufort Sea, if it started production, would be producing something like 1 million barrels a day, is that right?

Mr. YOUNG. Beaufort Sea is not quite as much as Chukchi but would probably be a million barrels a day. We were producing 2.2 million barrels at one time out of Prudhoe Bay.

Mr. WHITFIELD. OK.

Mr. YOUNG. And that has that capacity.

Ms. MURKOWSKI. And if I might just add, Mr. Chairman, we have not given up on opening up ANWR, an incredible reservoir just to the east of Prudhoe Bay. That, too, could yield a million barrels a day. Now, think about what that means to us in our economy and our jobs and our revenues into this country, $153 billion that this country could benefit from.

Mr. WHITFIELD. Absolutely. Mr. Rush, you are recognized for 5 minutes.

Mr. RUSH. Thank you, Mr. Chairman. Mr. Chairman, I am kind of bemused at the finger-pointing at the EPA for essentially coupling the EPA's activities with the activities of the Obama administration. I recall—and you can correct me if I am wrong here—I think the current EPA administrator has been in office for about 2 years. And as the Senators, who I really deeply respect and Chairman Young who I deeply, deeply respect, they both have indicated that this permitting process has been delayed for about 5 years. So it seems as though the EPA under the Bush Administration was the first one to delay these permits. Is that true?

Mr. YOUNG. I would suggest one thing. There is no administration to blame for the EPA but the fact that Richard Nixon created it. And he created a lot of other problems, too. But the truth of the matter is is I am not laying this blame on the President, because I think there is a disconnect with the President and the EPA, but that is the creation of power that has been generated over the years. You know, this is not the first time I have done battle with the EPA. They have been trying to insist on an arsenic quality in water on the Kenai Peninsula where we put in a project because of the EPA 20 years ago to meet the standard. And now they come back and say you have got to do it again with no science behind it.

Mr. RUSH. Mr. Chairman, I do understand. I just want to make sure that—you know, it seems as though there are some who are trying to point their fingers——

Mr. YOUNG. No, I am not.

Mr. RUSH [continuing]. At the President and I don't think that the President at this time is responsible for these delays.

Now, let me just ask—either of you can answer this or all of you can answer this—I understand the EPA did issue permits but they were invalidated by the EAB. Can you tell the committee the circumstances of why the EAB invalidated the permits and whether or not you agree with those circumstances? Or what were the particulars?

Ms. MURKOWSKI. I think you will get some additional testimony on this this afternoon just looking through the witness list here. But I think the simple story is is that in fact a permit was issued. The EAB then came in and determined that the issuance of that permit was not supported because there had been subsequent changes to the EPA requirements. So in other words, you have been working on a process for a period of years. You get that through the process, the permit is issued, and then the EAB comes in and says well, in fact we have changed the rules. We have changed the requirements. In other words, we have moved the goalposts. And so this permit that was issued is no longer a valid permit. Again, there are clearly more details that I think will be spoken to later, but it was a situation where the rules were changed, I think, in the middle of the process, again, thwarting the ability to gain a permit that had been in process for 4 years.

Mr. BEGICH. If I can respond, too, Congressman, just to echo those comments, but also the bigger picture here, the amount of time it takes as compared to the Gulf of Mexico to do the same kind of operation even, in some cases, deeper water, clearly, higher pressure, clearly, than what we operate and hope to operate in the Arctic. And I guess my point—and I agree 100 percent with Senator Murkowski—that the goalpost was kind of moved down the line, but put that aside. For us to take this many years may be the ConocoPhillips development on the petroleum reserve established by the country——

Mr. RUSH. With all due respect, I only have a few more minutes and I have another point I want to make. And I just want to say that, you know, I am concerned also about the length of time that these permits are taking.

But on a matter of Administrator Jackson's statement that was alluded to earlier. I have looked at her statements about health impacts and there is a context in which she made this statement. She did not say that these operations have no potential for health impacts. She was discussing the permit that EPA had granted which required Shell to install air pollution controls. The EAB had asked EPA to provide better analysis showing that the final permit, in fact, protected local communities and set aside environmental concerns. In that context, Administrator Jackson expressed confidence that further analysis would show that EPA's permit was, in fact, sufficiently protective. Nothing in her statement supports the notion that we can shortchange air quality protection because these sources don't threaten health.

If we had EPA here, we could hear from them directly on this point, Mr. Chairman. I yield back the balance of my time.

Mr. WHITFIELD. It is the practice of this subcommittee that when we have a panel of witnesses that are in the Senate or in the House that the chairman and ranking member are the only ones who will ask questions.

So I want to thank you all very much for taking time to be here. We look forward to working with all of you as we pursue this legislation. Thank you very much.

Mr. YOUNG. Thank you.

Mr. WHITFIELD. At this time, we will call the second panel of witnesses. On the second panel, we have the Honorable Dan Sullivan, who is the commissioner of the Alaska Department of Natural Resources. We have Mr. David Lawrence, who is the executive vice president of exploration and commercial development with Shell. We have Ms. Rosemary Ahtuangaruak, former mayor of Nuiqsut, Alaska. We have Mr. Richard Glenn, who is the executive vice president, Arctic Slope Regional Corporation. We have Dr. Scott Goldsmith, who is professor at the Institute for Social and Economic Studies at the University of Alaska. We have Mr. Erik Grafe, who is staff attorney for Earthjustice. And we have Mr. Robert Meyers, who is senior counsel of Crowell & Moring.

I want to thank all of you for taking time to be with us this morning as we discuss this discussion draft.

And at this time, Mr. Sullivan, I appreciate your coming all the way from Alaska, and I will recognize you for 5 minutes for your opening statement.

STATEMENTS OF THE HONORABLE DAN SULLIVAN, COMMISSIONER, ALASKA DEPARTMENT OF NATURAL RESOURCES; DAVID LAWRENCE, EXECUTIVE VICE PRESIDENT, EXPLORATION AND COMMERCIAL DEVELOPMENT, SHELL; ROSEMARY AHTUANGARUAK, FORMER MAYOR, NUIQSUT, ALASKA; RICHARD K. GLENN, EXECUTIVE VICE PRESIDENT, ARCTIC SLOPE REGIONAL CORPORATION; SCOTT GOLDSMITH, PROFESSOR, INSTITUTE FOR SOCIAL AND ECONOMIC STUDIES, UNIVERSITY OF ALASKA, ANCHORAGE; ERIK GRAFE, STAFF ATTORNEY, EARTHJUSTICE; AND ROBERT J. MEYERS, SENIOR COUNSEL, CROWELL & MORING

STATEMENT OF DAN SULLIVAN

Mr. SULLIVAN. Thank you, Mr. Chairman. Good morning. Representative Rush, good morning, sir. My name is Dan Sullivan. I am the commissioner of the Alaska Department of Natural Resources. I am also a former attorney general of Alaska, former U.S. Assistant Secretary of State with responsibilities over global energy, finance, and economic issues, and I am currently a U.S. Marine Corps reserve officer as well.

Mr. Chairman, I have submitted extensive written testimony for the record and would like to briefly touch on the main points.

Our country faces very serious energy security challenges, and Alaska can and should be able to play a significant role in partnership with the Federal Government in helping our fellow citizens address these challenges. Unfortunately, right now that is not happening. And I would like to explain that in a little bit more detail.

Alaska is home to one of America's most vital components of energy security infrastructure, the Trans-Alaska Pipeline System. As Congressman Young stated, Congress played the critical role in the creation and rapid construction of TAPS. You are the godfather of this critical American asset. Unfortunately, your godson sits two-thirds empty from its peak of 2.2 million barrels a day down to 640,000 barrels a day and declining. Working together, we are confident that we can fix this situation and further promote America's energy security.

First, as was already mentioned, the North Slope of Alaska—by any measure both on- and offshore—remains one of the world's most productive hydrocarbon basins with estimates of convention and unconventional oil in the billions of barrels and estimates of natural gas in the trillions of cubic feet.

Second, Alaska is one of the most environmentally stringent places on earth to explore and produce hydrocarbons. We are also one of the world's top innovators of safer environmental technologies.

And third, the State of Alaska is doing all it can to reverse the TAPS throughput decline with a comprehensive set of reforms that include significant tax and fiscal reform, permitting overhaul, and the creation and construction of new infrastructure projects. But we are missing a critical partner, Mr. Chairman, and that is the Federal Government.

The Federal Government's policies in Alaska have shifted from helping us protect our environment—which we support because we care deeply about it—to proactively shutting down resource development. Now, this is not just rhetoric. As Senator Begich said, this is a widespread problem in Alaska.

If you look at pages 13 through 18 of my written testimony, I provide 7 specific examples in less than 2 years where the Federal Government has made decisions that will stall, kill, or delay resource development on state and federal lands in Alaska. This antidevelopment posture by our own Federal Government is the cause of enormous frustration and anger for a vast majority of Alaskans. Now, the State has done all it can—countless meetings, letters, public comments, testimony, and yes, even suing our own Federal Government—to dissuade the federal administration from pursuing and continuing locking up Alaska's resources. Why? Because we believe in doing so, locking up the resources, it not only hurts Alaskans, it significantly undermines broader American interests.

Rarely has there been a federal policy that fails on so many fronts. Jobs and economic growth, energy security, the national trade deficit, the federal budget deficit, and national security are all undermined when Americans are prevented from producing energy for our own citizens from the largest resource basin in the country. Ironically, this policy also undermines global environmental protection because it drives resource development overseas to places like Brazil, Russia, Saudi Arabia, Kazakhstan, Azerbaijan. Mr. Chairman, I have been to all these countries. This committee can be sure that they do not have nearly the stringent environmental standards that we have in Alaska.

But my main purpose in traveling from Alaska today is not to complain but to redouble our efforts to achieve the federal partnership that we believe is so critical for Alaska and America's success.

So in closing, Mr. Chairman, I believe there are three important things Congress can do. First, support Alaska's goal of one million barrels of oil through TAPS within 10 years. Attached at the end of my written testimony is a recent letter from Governor Sean Parnell of Alaska to President Obama asking the President to support this ambitious goal which Governor Parnell laid out last week. We believe the Congress should make achieving this goal a national priority, one million barrels of oil through TAPS within a decade.

Second, continue to work on permitting reform to expedite and bring certainty to federal permitting decisions. During World War II, America built the 1,400-mile ALCAN Highway in less than a year. Today, a project like that would take 5 years just to fill out the EIS application.

And finally, Mr. Chairman, Congress should continue its vigilant oversight role of federal agencies that make resource decisions in Alaska. As a former attorney general, I believe that some of these decisions are made with little regard to Congress' declared national policies and federal law, and I think it is important to recognize that.

Thank you very much, Mr. Chairman.

[The prepared statement of Mr. Sullivan follows:]

Testimony before the U.S. House of Representatives
Subcommittee on Energy and Power

The American Energy Initiative

April 13, 2011

Submitted by:
Dan Sullivan, Commissioner
Department of Natural Resources
State of Alaska

I. Introduction: America's Energy Challenge

Chairman Whitfield, Ranking Member Rush, and members of the House Subcommittee on Energy and Power, on behalf of Governor Sean Parnell, the State of Alaska welcomes this opportunity to testify in support of the American Energy Initiative. More specifically, we want to demonstrate to this committee and the rest of your colleagues in the U.S. Congress the vital role Alaska can play in enhancing America's long-term energy security, expanding American employment, growing the economy, providing significant revenue to federal, state, and local governments, and delivering billions of barrels of domestically produced hydrocarbons to the U.S. marketplace.

Biographical Information

Before getting into substantive matters, I would like to briefly mention my professional background as it pertains to this testimony. I have been serving as commissioner of the Alaska Department of Natural Resources (DNR), a state agency of over 1,100 personnel, since December 2010. Under the Alaska Constitution, my primary responsibility as the DNR commissioner is to maximize the development of the state's resources in a manner that furthers the public interest. DNR is responsible for managing the State of Alaska's vast land, energy, and natural resources with approximately 100 million acres of uplands, 60 million acres of tidelands, shore lands, and submerged lands, and 40,000 miles of coastline. DNR manages one of the largest portfolios of resources in the hemisphere.

Prior to being appointed as the DNR Commissioner, I served as Alaska's Attorney General. One of my areas of focus was on issues relating to natural resource management and development. From May 2006 to January 2009, I served as the U.S. Assistant Secretary of State for Economic, Energy, and Business Affairs, where much of my work focused on international energy issues, including serving as the U.S. Governing Board member of the International Energy Agency. Prior to my time as U.S. Assistant Secretary of State, I served as a Director in the International Economics Directorate of the National Security Council and National Economic Council staffs at the White House. I am also a United States Marine, having served on active duty and in the reserves as an infantry and reconnaissance officer since 1993.

America's Energy Challenge—Our Country's Need for Domestic Energy Production

This subcommittee has properly recognized that some of our country's biggest challenges center on energy security, national security, employment, and the national deficit. Pursuing smart policies that promote responsible energy development in America can help the country meet and overcome these challenges.

Alaska is a leader in promoting all types of energy, including our massive renewable energy base of hydro power, geothermal, wind, and biomass. We are also a national leader in promoting energy efficiency throughout our state. We cannot, however, talk about strategies to ensure our country's energy security without discussing our critical need to increase domestic production of oil and gas. Imposing needless delays and halting domestic production is not the solution, particularly with oil prices at $120/barrel and the average price of gasoline nearing $4/gallon. Alaskans are feeling this pinch more than most, with the average price of gas in Anchorage at $4.07 and $4.46 in the North Slope community of Barrow. The International Energy Agency is also forecasting that OPEC countries will receive over a trillion dollars in oil revenues from exports this year. There is much that the State of Alaska can do to help ensure our country's long run energy security.

Today's Testimony

I am here today to explain how Alaska stands ready to be a critical partner with the federal government to help our country meet its energy security challenges. My testimony will focus on the following:

- Alaska's North Slope remains a world class hydrocarbon basin
- Alaska's strong record of responsibly developing resources while protecting the environment
- The Trans-Alaska Pipeline System (TAPS) is one of America's most important energy infrastructure assets
- The State of Alaska's efforts to arrest the TAPS throughput decline and increase North Slope production
- Recent federal decisions and policies that have focused on proactively shutting down resource development in Alaska
- Alaskan's broad-based frustration with such federal policies
- The State of Alaska's desire to partner with the federal government to increase TAPS throughput to ensure we reach our shared goals of boosting domestic production and decreasing our dependence on foreign oil

As this testimony will demonstrate, the State of Alaska supports legislative measures that bring clarity, certainty, and timeliness to the permitting process and therefore is in favor of the goals set out in the Discussion Draft of H.R.__, the "Jobs and Energy Permitting Act of 2011."

II. Alaska's North Slope Remains a World Class Hydrocarbon Basin

Alaska is one of the nation's most critical and prolific oil-producing states. Even though production is only about one third of what it was at its peak in 1989, Alaska's North Slope, both on and offshore, remains a world-class hydrocarbon basin with extraordinary potential. According to the U.S. Geological Survey (USGS), Alaska accounts for over 30% of the nation's technically recoverable oil and gas resources, with the North Slope estimated to hold approximately 40 billion barrels of technically recoverable conventional oil and 236 trillion cubic feet of natural gas.

Alaska's Outer Continental Shelf (OCS) constitutes an important share of these totals, with an estimated potential for 27 billion barrels of conventional oil and 132 trillion cubic feet of natural gas. Studies have found that Alaska Beaufort and Chukchi Sea development could result in about 700,000 barrels of oil per day for 40 years. This is equivalent to the amount of oil that the United States imports each day from Iraq and Russia combined.

Considerable reserves also exist onshore. A United States Geological Survey (USGS) report in 1998 showed that the 1002 Area in the Arctic National Wildlife Refuge (ANWR) may have the highest potential for an enormous oil field of any place onshore in the United States, with an estimated 10.4 billion barrels of crude reserves. Some estimate that production from ANWR alone could reach one million barrels per day (bpd), which is an amount that exceeds the country's 2010 imports from Venezuela (827,000 bpd) or Saudi Arabia (958,000 bpd).

In addition to conventional oil and gas reserves, Alaska's North Slope contains massive quantities of unconventional resources: shale oil and gas, heavy and viscous oil, and gas hydrates. The U.S. Department of Energy has estimated that there is 36 billion barrels of heavy oil on the North Slope. (No current estimates exist of Alaska's shale oil and gas reserves.) Most of these unconventional resources are located onshore near existing infrastructure. Energy companies are beginning to plan for developing these resources in Alaska.

Despite the extraordinary production and massive hydrocarbon potential, Alaska remains relatively underexplored compared to any other prolific oil and gas region in North America. Only 500 exploration wells have been drilled within a 150,000-square-mile area on the North Slope—an area that maintains the highest undiscovered conventional oil and gas potential in Alaska. That calculates to three wells per 1,000 square miles. As a comparison, 75,000 square miles within the state of Wyoming, endowed with high oil and gas potential, has more than 19,000 exploration wells, or about 250 wells per 1,000 square miles.

With this remarkable potential, Alaska can play a pivotal role in helping our country meet its significant energy and security challenges; reduce our reliance on foreign oil; provide thousands of high paying jobs; reduce the nation's trade deficit; and provide significant revenue to local, state, and federal governments.

III. Alaska Has a Strong Record of Responsibly Developing Resources while Protecting Our Environment; We Are Also a Leader in Environmental Research

Alaska has some of the most stringent environmental policies and regulations in the world and we are a leader in research for sound natural resource development. We love our state, not only for its economic opportunities, but also for its natural beauty, and we are very focused on protecting our environment.

The State of Alaska strongly believes that responsible resource development and protecting the environment go hand in hand and we have a strong record of upholding the Alaska Constitution's mandates that the state pursue responsible resource development in a manner that safeguards the environment.

Alaska's Robust Efforts to Protect the Environment

To ensure responsible resource development while protecting the environment, the state has devised a comprehensive system that imposes rigorous environmental protections. What follows are just a few of the measures the state requires before oil and gas development can proceed.

- State agencies follow a rigorous scientific protocol to ensure the right combination of snow depth and temperature are met before allowing cross-tundra travel or construction of ice roads. Such protections ensure that the tundra is not degraded.
- Before drilling wells, operators must get approval from the state and explain how they will comply with strict mitigation measures imposed by regulatory agencies; they must demonstrate that their blow-out prevention equipment (BOP) is up to the state's high standards; and they must get approval for their oil-spill contingency plan.
- The state encourages the unitization of leases that overlie reservoirs to minimize the environmental impacts of development.

- Alaska law for oil discharge prevention and contingency planning requires the plan holder to be able to contain or control and clean up the realistic maximum oil discharge within 72 hours.
- Alaska is the only state or federal governmental jurisdiction that regulates flow lines. Flow lines transport three phase liquids from the well head to the processing centers, which separate gas and water from crude oil. Flow lines are viewed as having the greatest corrosion potential and are therefore considered to be the highest risk.
- Alaska mandates that operators use the best available technology for oil discharge containment, storage, transfer, and cleanup.
- State agencies impose significant bonding requirements.
- Wildlife are closely monitored and protected. Just last month, after a petroleum worker notified the U.S. Fish and Wildlife Service (USFWS) that a polar bear had emerged from a den near their drill site, the operation was shut down and all 50 employees evacuated in less than 12 hours.

Our efforts at protecting the environment and wildlife have been successful. For example, when debating the development of TAPS, many predicted that oil and gas development would decimate caribou herds. These predictions have not come true. In fact, caribou numbers have increased dramatically over the past thirty years. The Central Arctic caribou herd, which occupies summer ranges surrounding Prudhoe Bay, has grown from 5,000 in 1975 to over 66,000 today.

Even with a robust regulatory regime, the state continues to look for ways to improve its regulatory oversight. To this end, the state is engaged in a comprehensive gap analysis to better understand the spectrum of state agency oversight; better understand the effectiveness of authorities and enforcement over oil and gas operations; and to identify gaps or redundancies in state oversight and determine if they need to be filled or eliminated as appropriate.

Because of the efforts taken by federal, state, and local governments and the energy industry, oil and gas development in Alaska is conducted in a safe and responsible manner with standards that exceed most other jurisdictions in the world.

Alaskan Innovations Minimize Environmental Impacts

In addition to the state's regulatory oversight, Alaska is a leader in innovations that protect the environment. For example, extended reach drilling, horizontal wells, multiple completions, and close-surface well spacing were all invented and pioneered for use in Alaska. These advances in drilling technology have greatly reduced the footprint of modern exploration and development wells in Alaska, while expanding their ability to stretch vertically and horizontally underground.

Safety and Spill Prevention in the Alaska OCS

Alaska has a strong record of safe OCS exploration. Prevention is always the first step in responsible environmental protection. Federal and state regulatory agencies impose some of the most rigorous requirements in the world to prevent well blow-outs and spills. Eighty-four exploratory wells have been safely drilled in federal waters off Alaska, with thirty-one wells drilled in the Beaufort Sea and five wells drilled in the Chukchi Sea.

In terms of safety and spill prevention, it is important to recognize that current plans for Alaska's OCS development are in water depths of approximately 150 feet, which nullifies many of the risks associated with deepwater drilling. Further, the state reviews all OCS exploration drilling and spill response plans through the Alaska Coastal Management Program to ensure that those activities are consistent with Alaska standards.

In the wake of the *Deepwater Horizon* spill in the Gulf of Mexico, it is understandable and appropriate to re-evaluate safety requirements for extreme deepwater exploration and production. It is critical, however, to underscore some of the material differences in operating conditions and risks between deepwater drilling in the Gulf of Mexico and the Alaska OCS:

- Oil and gas development in the Alaska OCS will occur in shallow water (150 feet compared to deepwater wells of 3,000 to 10,000 feet).
- The wells are drilled at less than 10,000 feet deep, compared to deepwater wells drilled at 18,000 feet plus.

- The pressure encountered in deepwater drilling is multiple times greater in the Gulf of Mexico than in Alaska.
- The wells and technology used in exploration activities in the Alaska OCS have been safely employed for decades.
- There is a robust review process by state and federal regulators in Alaska.

The state takes its job of ensuring that appropriate resources are in place to respond in the event of an offshore oil spill very seriously. The initial responders to any oil spill in Alaska are the entities responsible for the spill and their spill-response contractors. For example, in the unlikely event of an oil spill or blowout, Shell will have an oil-recovery ship and tanker built for Arctic ice conditions, a relief drill rig, and other cleanup vessels on standby. With this equipment at hand, Shell says it will be ready to clean up oil within an hour of an event. Federal and state regulators will monitor these cleanup efforts from vessels and aircraft.

Substantial Studies Have Been Conducted Regarding Alaska OCS Development

Despite the considerable energy security and economic benefits of Alaska OCS development, some have suggested that before leasing additional OCS acreage, more scientific studies need to be conducted. We disagree.

As part of the North Slope Science Initiative (NSSI), there are over 50 organizations and initiatives currently doing scientific work in the Arctic. The NSSI is formally authorized by the Energy Policy Act of 2005; its mission is to improve scientific and regulatory understanding of terrestrial, aquatic, and marine ecosystems in Alaska's North Slope region for consideration in the context of resource development activities and climate change.

Since 1973, federal agencies have performed more than 5,000 environmental studies to better understand the Alaska OCS. Over the past 30 years, the Department of the Interior (DOI) has funded nearly $300 million for environmental studies in Alaska. And since 2000, it has conducted 30-40 environmental studies each year, spending over $45 million.

Additionally, the National Academy of Sciences has produced three Alaska OCS reports on environmental science which guide OCS activity. Industry has also spent millions to better understand the Arctic ecosystem; Shell alone spent over $40 million in the last several years on environmental studies.

On this strong scientific basis, the Obama Administration's Department of the Interior released a "Survey of Available Data on OCS Resources and Identification of Resource Gaps" in 2009. In this report, the DOI concluded: "Overall, an adequate baseline of information exists to address the environmental effects of the OCS oil and gas program…in support of leasing decisions." Thus, according to the current federal administration, sufficient studies have been conducted to support oil and gas leasing.

IV. Co-Located with Alaska's Massive Hydrocarbon Basin Is One of America's Most Important Energy Infrastructure Assets: TAPS

The Trans Alaska Pipeline, 11 pump stations, several hundred miles of feeder pipelines, and the Valdez Marine Terminal constitute the Trans-Alaska Pipeline System (TAPS). At 800 miles long, the Trans Alaska Pipeline is one of the longest pipelines in the world; it crosses more than 500 rivers and streams and three mountain ranges as it carries Alaska's oil from Prudhoe Bay to Valdez.

Congress was Instrumental in the Rapid Development TAPS

Spurred by global concern over the 1973 oil crisis (OPEC embargo) and spiking energy prices that resulted in a severe U.S. and global recession, the U.S. Congress was instrumental in the approval and rapid development of TAPS. Congress approved construction of the pipeline with the Trans Alaska Pipeline Authorization Act of 1973. The principle focus of this Act is as relevant today as it was in 1973: "the early development and delivery of oil and gas from Alaska's North Slope to domestic markets is in the national interest because of growing domestic shortages and increasing dependence upon insecure foreign sources."

Underscoring the urgency of the country's precarious energy security position, the Trans Alaska Pipeline Authorization Act also halted all legal challenges to delay construction of the pipeline and ensured that additional government studies would not be used to delay construction.

Under its Congressional declaration of purpose this Act states: "The purpose of this chapter is to insure that, because of the extensive governmental studies already made of this project and the national interest in early delivery of North Slope oil to domestic markets, the trans-Alaska oil pipeline be constructed promptly without further administrative or judicial delay or impediment. To accomplish this purpose it is the intent of the Congress to exercise its constitutional powers to the fullest extent in the authorizations and directions herein made and in limiting judicial review of the actions taken pursuant thereto."

The first oil entered the pipeline in June of 1977. Since that time, TAPS has transported over 16.3 billion barrels of oil and natural gas liquids for the U.S. domestic market. Oil and natural gas liquid production through TAPS peaked at 2.2 million barrels per day in the late 1980s, representing 25% of U.S. domestic production. Since its peak, however, TAPS throughput has steadily declined. By 2003, production was down to one million barrels a day. Today, TAPS throughput averages about 640,000 barrels per day.

TAPS Throughput Decline Raises a Host of Difficult Issues

The reduced flow of oil through TAPS has reached a point where the pipeline is now approximately two thirds empty. Continued throughput decline raises a host of technical challenges due to the slower velocity of oil in the pipeline, longer transit times, and the resulting dramatic lowering of the temperature of oil during the winter months. These challenges include wax buildup, frost heaves, and ice crystals and ice plugs. The likelihood of these problems occurring increases with lower throughput, and they can cause additional TAPS shutdowns and oil leaks that could harm the environment. This past January, TAPS was shut down for five days as the result of a leak at Pump Station 1 that was contained in a building.

The State of Alaska is working with industry to ensure that we are prepared to address these additional challenges in the near term as TAPS throughput decline continues. The state has also been prepared to take more aggressive actions, such as litigation, with regard to these matters where appropriate. But clearly, the most effective way to address these technical challenges and the environmental risks that they may entail is to increase TAPS throughput.

A Premature Shutdown of TAPS Would Significantly Undermine U.S. National Security and Energy Security Interests and Would Devastate the Alaskan Economy

The January 2011 shutdown of TAPS, during the heart of a cold Alaskan winter, not only focused attention on the significant technical challenges of decreased TAPS throughput, but also raised the specter of a broader premature shutdown of TAPS. Such a shutdown would significantly undermine U.S. national security and energy security interests and would devastate the Alaskan economy.

A premature shutdown of TAPS would result in the stranding of billions of barrels of domestic oil in America's largest hydrocarbon basin. Oil prices would continue to soar. Thousands of jobs would be lost. U.S. refineries would likely have to turn to foreign sources of oil, as they did when TAPS shutdown in January, thereby increasing the U.S. trade deficit and undermining American national and energy security.

A premature TAPS shutdown would also have a crushing impact on Alaskans. It has been estimated that one third of the Alaska economy is connected to the oil industry. The loss of North Slope oil production would deprive state and local governments of billions of dollars in annual revenue—in 2009, the state's total taxes and royalties from oil and gas production was $6.1 billion. Government services including education, public safety, and health care would be slashed and infrastructure projects would be significantly curtailed. Rural communities, particularly those that have significantly benefitted from oil development such as the North Slope Borough, would face a significant decrease in their standard of living.

But continued TAPS throughput decline does not need to be Alaska's or the country's destiny. The massive North Slope hydrocarbon resource base remains available for development. What is needed to ensure a reversal of this decline are state and federal policies that promote increased investment, responsible resource development, and increased job creation on the North Slope.

V. The State of Alaska Is Doing All It Can to Arrest the TAPS Throughput Decline in Order to Achieve the Goal of One Million Barrels of Oil per Day within 10 Years

The State of Alaska is pursuing several major policy initiatives to arrest the TAPS throughput decline. The cornerstone of this effort is Governor Parnell's recent proposal to the Alaska Legislature to increase Alaska's global competitiveness by enacting significant tax reform. Under Governor Parnell's plan, production taxes will be lowered and the state will offer credits to incentivize additional drilling.

The state is in the process of enacting other reforms that will attract more investment and, ultimately, increase oil production on the North Slope and employment for Alaskans. For example, the Governor's budget focuses on developing significant infrastructure projects to build more roads to our abundant resources. We are also seeking to reform our permitting system to enhance timeliness, predictability, and efficiencies.

One Million Barrels of Oil Per Day Within 10 Years

Over the past twenty years, North Slope production has steadily declined. TAPS is currently producing about 640,000 barrels per day. During the last several years, this throughput decline has averaged 6% per year. In the face of steadily declining production, Governor Parnell recently announced an ambitious but critical goal for Alaska and the country to increase TAPS throughput to one million barrels of oil production per day within a decade. This ambitious goal will be supported by an overall state strategy that seeks to:

- Enhance Alaska's global competitiveness and investment climate.
- Facilitate and incentivize the next phases of North Slope development: Gas, OCS, federal onshore lands, heavy and viscous oil, shale oil, and smaller pools of conventional oil.
- Promote constructive partnerships between the state and industry to facilitate increased investment, exploration, and production while protecting the state's interests and safeguarding the environment.
- Unlock Alaska's full resource development potential through an improved federal partnership.

- Promote Alaska's abundant resources and positive investment climate to domestic and international markets.

The policies described above will significantly benefit Alaska, but will also significantly benefit our fellow citizens in the lower 48 as they struggle with spiking oil and gas prices that affect their livelihood and standard of living. Unfortunately, the executive branch of the federal government does not have a similar focus. Indeed, as detailed below, their focus has been to proactively shut down or delay resource development throughout Alaska.

VI. Federal Decisions and Policies Have Sought to Proactively Shut Down Resource Development in Alaska

Many of the most promising oil and gas resources in Alaska are in federal lands. Development of these lands, in particular from the OCS, Arctic National Wildlife Reserve, and National Petroleum Reserve – Alaska (NPR-A), could result in production of over a million barrels of oil a day. Unfortunately, the federal government has consistently denied access to these lands, made decisions that have added significant delays to promising projects, and pursued policies that have chilled the investment climate.

More specifically, the federal government has a made a series of decisions that prevent or stall responsible development of domestic energy in Alaska. We believe that the following list will be of concern to members of this committee and your colleagues in Congress.

NPR-A (A Region Specifically Set Aside for Oil Exploration and Production)/CD-5 Critical Permit Denial

Last winter, the U.S. Army Corps of Engineers (Corps) derailed ConocoPhillips (CP) development of CD-5, which is a field on the eastern edge of the NPR-A. Once infrastructure is in place, CD-5 will open satellite fields in the eastern NPR-A to development. The state, CP, and Native communities worked with the Corps for years on the project to ensure that responsible safeguards are in place to open this field to development. In response to concerns raised by some stakeholders, the project was modified to minimize environmental impacts and the project garnered strong support from all stakeholders. After years of collaboration, the permits were considered a foregone conclusion. The first production from CD-5 was expected to start in 2012.

Nevertheless, in February 2010, the Corps reversed course and denied CP's permits to construct a drill pad, a pipeline/vehicle bridge across the Nigliq Channel in the Colville River Delta, and access roads. The Corps concluded that there are practicable alternatives to the bridge, drill pad, and roads that would have fewer environmental consequences. This decision was apparently impacted by the EPA's designation of the Colville River as an Aquatic Resource of National Importance (ARNI)[1], in which the EPA can determine that issuance of a permit will result in unacceptable adverse policies and procedures.

More specifically, the District Engineer found that CP should use Horizontal Directional Drilling (HDD) under the Nigliq Channel to access the reservoir. The HDD alternatives effectively eliminate a road, including the Nigliq Channel bridge, that would have provided direct access between CD-5 and existing production, operations, logistics, and transportation infrastructure at the Alpine facilities.

Many Alaskans viewed the Corps decision as a blanket attempt to shut-down NPR-A development; particularly given that Alaska state agencies viewed the Corps recommended approach – a pipeline under the river – as much more environmentally risky. The District Engineer's decision was opposed by all the affected surface and subsurface land owners, most of them Alaska Natives. (The State owns the subsurface rights of two leases affected, as well as the Nigliq Channel river bed.)

The permit denial was eventually appealed and the Corps' Pacific Ocean Division issued a decision on December 2, 2010, remanding the District Engineer's denial of CP's permit request to the District Engineer. Nevertheless, the status of CD-5, after five years of delays, remains uncertain, thereby chilling the investment climate over the entire NPR-A – an area set aside specifically by Congress for oil and gas exploration and development.

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[1] An Aquatic Resource of National Importance (ARNI) is a resource-based threshold used to determine whether a dispute between the EPA and the Corps regarding individual permit cases are eligible for elevation under the 1992 Memorandum of Agreement between the two agencies—an agreement associated with Section 404(q) of the Clean Water Act.

DOI's Wild Lands Designation

Another decision chilling the investment climate in the NPR-A and beyond is the federal governments new "Wild Lands" policy. Secretary Salazar recently issued Secretarial Order 3310, which empowers the BLM to convert vast areas of Alaska, including the NPR-A, into a de-facto wilderness area without Congressional oversight or approval. State officials have heard from many resources companies who have said if state lands receive a Wild Lands designation they may not continue to invest in Alaska. The state is therefore very concerned that this order will chill the investment climate, and, if implemented, would shut-down resource development in the NPR-A and other areas of Alaska. For this reason, the state (and other states) is examining legal options to prevent such a designation.

OCS Permitting Delays Shutting Down Exploration Activities

The greatest potential for significant oil and gas production lies in the OCS. In recent years, Shell and other leading energy companies have spent billions of dollars to acquire leases and explore the OCS. Shell has also received approval for several exploration plans and has acquired over 34 federal permits to drill exploration wells. Yet its exploration plans have been repeatedly derailed; first by the 9th Circuit Court of Appeals in 2008 and more recently by the DOI and the Environmental Protection Agency (EPA).

Shell has proposed drilling activities for the Beaufort Sea on its leases. In November 2006, Shell submitted the first version of its exploration plan for the Beaufort Sea region. Shell's exploration plan details its plan to drill up to twelve exploratory wells on twelve lease tracts in the Beaufort Sea between 2008 and 2011. (The lease blocks stretch from the Colville River Delta eastward to the Canadian border.)

Litigation filed by environmental groups, however, derailed these development plans.

Shell submitted a new exploration plan for the Beaufort Sea, which was approved by Mineral Management Service (MMS). After the MMS approved the development plan, environmental groups filed suit. In the spring of 2010, Shell, the State of Alaska, and the Obama Administration successfully defended the permits before the 9th Circuit. It looked like Shell was finally going to be able to drill exploration wells in the OCS in the summer of 2010. Then the Macondo well disaster happened and the Obama Administration reversed course and suspended all operations in the Alaska OCS.

More specifically, DOI Secretary Salazar, in a press release, congressional testimony, and at a press conference in Alaska, stated that he was imposing an Arctic Moratorium on OCS exploration and development. The state sued the DOI, alleging that the moratorium violated several federal laws. The Bureau of Ocean Energy Management and Regulator Enforcement (BOEMRE) responded by denying the existence of a moratorium; they then began to process Shell's exploration plan. For these reasons, the U.S. District Court granted the federal government's summary judgment motion. One day before the court's decision, however, NOAA stated in a federal register that it would not issue an incidental take authorization for Shell because DOI had suspended operations in the OCS.

Shell recently announced that it was canceling its exploration plans for this summer because it was unable to secure an EPA air permit. After acquiring over 34 permits in support of its drilling operations and spending billions of dollars over the past five years, Shell still has not drilled one well in the Alaska OCS. It is not surprising that this episode has put into question the viability of developing the massive Alaska OCS hydrocarbon reserves.

ANWR Wilderness Designation

The USGS has demonstrated that perhaps the greatest potential in America for an onshore elephant-size field is in the 1002 Area of ANWR. Despite this potential, the federal government has consistently refused to open the 1002 Area to exploration. More recently, the USFWS is reviewing whether to designate the 1002 Area in ANWR as "Wilderness," which would essentially lock-up ANWR from any oil and gas development. In the federal register notice, the USFWS expressly prohibited the public from filing comments related to oil and gas activity. The state believes that such action conflicts with federal laws—under the National Environmental Protection Act (NEPA) and the Alaska National Interest Lands Conservation Act (ANILCA), the USFWS must consider the benefits of oil and gas development before making a recommendation to Congress on a Wilderness designation. We have made this view known to the USFWS.

These decisions have been made in the face of overwhelming public support for oil and gas development in the 1002 Area. Polls consistently show that over 73% of Alaskans support ANWR development. The North Slope communities, including residents of ANWR, also strongly support development. And over the past 30 years almost every single member of the Alaska State Legislature has voted on resolutions in support of ANWR exploration and development.

For these reasons the state continues to protest any plan or wilderness review process that further encumbers the potential for oil and gas development on the coastal plain of ANWR. Americans throughout the country should be concerned with this attempt to shut down responsible resource development in the 1002 Area. It makes no sense to the state that the USFWS wants to lock up an estimated10 billion barrels of domestic oil. Oil and gas development in the 1002 Area would provide secure on-shore domestic supply of energy for the nation, create tens of thousands of jobs nationwide, ensure the continued operation of the TAPS for years to come, and could help meet U.S. demand for 25 years or more.

200,000 Square Miles of Critical Habitat Designated for Polar Bears

The polar bear and its habitat are already well managed and conserved by Alaska, international agreements, conservation programs, and state and federal law. These laws and policies make the polar bear one of the most protected species in the world. Nonetheless, the USFWS recently designated nearly 200,000 acres of the North Slope —which covers an area larger than the size of California—as critical habitat for the polar bear. Never before has the USFWS interpreted its authority to designate such a vast expanse of critical habitat for a species. Worse, the USFWS acknowledges that the designation will not provide significant additional conservation measures for the polar bear and its habitat and that the primary claimed threat to the species (loss of sea ice due to climate change) will not be alleviated by this designation.

Despite providing no benefits, the critical habitat designation imposes another layer of costly regulation on Alaska, its citizens, and its economy. The state and many others believe that the USFWS's massive critical habitat designation violates federal law, will impede North Slope resource development, and will generate countless lawsuits filed by environmental groups to stall every phase of an oil and gas development project. Such lawsuits would delay projects, foment regulatory uncertainty, and increase the cost of doing business in Alaska.

Ocean Zoning/Marine Spatial Planning

President Obama recently signed an Executive Order creating a new federal bureaucracy tasked with setting ocean policy and requiring marine spatial planning (ocean zoning) in all U.S. waters. Executive Order 13547 could have significant adverse impacts on commercial use and development in the oceans and coastal zone.

Point Thomson EIS Delay

ExxonMobil has committed to a Point Thomson development plan to produce approximately 10,000 barrels of natural gas condensate starting in 2014. The EIS, however, has not been processed in a timely fashion. As a result, the start-up date for the project has been delayed from 2014 to 2015.

The Cumulative Impact of These Federal Decisions: Broad Based Policy Failure

As this section demonstrates, the federal government has consistently sought to delay, shut down, or prevent resource development in Alaska through its decisions and broad policy mandates. Rarely has there been a federal policy that fails on so many fronts:

- Economic and job security—these policies have killed hundreds of jobs in Alaska.
- Trade deficit—shutting down resource development in Alaska ensures that we import more oil from overseas.
- Federal budget deficit—by denying Americans access to their own lands to produce oil, the federal government is foregoing billions in federal revenues, and instead Americans are forced to help fill the treasuries of countries such as Venezuela, Russia, and Saudi Arabia.

- Energy security—foregoing and shutting down development of Alaska's massive sources of domestic energy undermines U.S. energy security.
- Foreign policy—On February 25, 2011, Governor Parnell gave a speech in Washington to the National Press Club detailing how the federal administration's antidevelopment policies undermine our foreign policy, and relegates the U.S. State Department to a reactive role given our dependence on foreign oil.

It is also important to underscore that the current federal administration's decisions and policies do not advance global environmental protection. To the contrary, they do the opposite. When oil and energy development in Alaska is shut down by our own government, development for such resources is driven overseas to places like Brazil, Russia, Iraq, Azerbaijan, and Saudi Arabia. Environmental standards in these places are not nearly as strong or strictly enforced as in Alaska, where stringent regulations are the hallmark of hydrocarbon production on the North Slope.

VII. There Is Deep, Broad-Based Frustration Throughout Alaska with the Federal Government's Anti-Development Policies and Decisions that Impede Responsible Resource Development

During my first three months as DNR Commissioner, I have attended hundreds of meetings across the state with community, business, and government leaders. The most striking observation is the overwhelming frustration among all participants with the federal government's anti-development policy that impinges on the state's ability to develop our own resources—to support ourselves, our nation, and our economy. Alaskans' frustration with federal policies extends to Democrats, Republicans, Independents, Native leaders, and industry; all have expressed dismay over the recent pattern of federal decisions that impede and shutdown resource development

Such frustration is exacerbated when Alaskans see the President encourage and welcome ultra-deep water oil drilling in Brazil, which has environmental standards and protections far inferior to those in Alaska, while his administration consistently denies Alaskans the opportunity to develop our own resources at home. Governor Parnell spoke for many Alaskans when he stated that: "the federal government should be focusing on increasing responsible energy development in America, not in Brazil. . . . . Our country has existing energy resources that stand ready to be produced. There is no more stable market in the world than here in America."

Frustration with the federal government's policies and decisions is a bi-partisan affair in Alaska. For example, on February 28, 2011, fourteen prominent Democratic state legislators submitted a letter to Secretary of the Interior, Assistant Secretary of the Army, and the Administrator of the Environmental Protection Agency, to urge these agencies to resolve the issues with ConocoPhillips' permit application to build a bridge over the Colville River to access the CD-5 field in the NPR-A. They believed that oil that would be accessed by this development is crucial to the viable, long-term running of TAPS. More specifically, they noted that, "in Alaska, this view is shared by Democrats, like us, and Republicans. It is not a partisan issue. There are environmentally responsible ways to access the CD-5 segment of NRP-A, and we believe Conoco's application meets these standards. Delay in development of this area is dangerous both to Alaska's economy and the nation's energy security. . . . We hope to convey that this is an issue of bi-partisan, economic urgency to Alaskans. We respectfully request that this issue be resolved favorably as quickly as possible."

Prominent Alaska Native groups are also experiencing mounting frustration over federal resource development policies, many of which they feel threaten their subsistence lifestyle and potential job opportunities for struggling rural communities. For example, the Arctic Slope Regional Corporation (ASRC), which owns title to nearly five million acres of land on Alaska's North Slope and represents 11,000 Inupiat Eskimo shareholders, and 10 other Alaska Native organizations have recently filed a notice to sue the federal government over its unprecedented designation of critical habitat for polar bears covering nearly 200,000 square miles of the North Slope.

Tara Sweeney, ASRC's Senior Vice President of External Affairs, stated in a January Op Ed in the Anchorage Daily News that the "critical habitat designation should concern all Americans…it is a poor attempt to legislate climate change through regulation, a failure of national security policy, and simply bad federal Indian policy . . . Alaska's resources are an important part of the nation's energy supply, an our own government is choking this supply. The U.S. will be forced to import energy resources from hostile regions like the Middle East or

Venezuela. This is a defective approach to domestic energy policy and clear and present danger Alaska Native communities."

As this committee is likely aware, this frustration with the federal government's anti-resource development policies extends beyond Alaska. Governor Parnell captured not only Alaskans' frustrations with federal policy, but also those of other states in a recent *Wall Street Journal* Op Ed: "Millions of American jobs are directly tied to our energy sector. Even as the energy sector necessarily diversifies, oil will continue to be a key piece of our national energy profile for many decades. And yet Alaska and the Gulf states have been blocked from developing America's oil by politically driven federal policy, much of it aided by misinformation. If Americans wonder what our economic Achilles' heel is, they need look no further than the federal regulatory system that delays permits for domestic exploration and production... By delaying leasing and permitting for exploration and development, and by locking up lands without congressional approval or authority, these agencies have locked down domestic oil with no responsibility for the consequences. The rest of us feel them: increased reliance on Middle East oil and lost economic opportunity."

VIII. Frustration with Federal Actions Has Spurred the State to Consult with Federal Officials to Reverse Policies and Decisions that Shut-Down Resource Development and, When Necessary, Litigate Over These Decisions

In response to the federal decisions and Alaska's frustration over these decisions the state has repeatedly reached out to federal officials to explain why their decisions are not in the public interest.[2] For example, on all of the issues discussed above, state officials, including the Governor, testify before committees, provide scientific documents and speak with federal officials, including cabinet-level secretaries, to explain why we support certain development activities. In these interactions we always look for areas of agreement.

But when the state has exhausted every administrative and legislative remedy, we turn to our judicial system. The state has found it necessary to litigate when it believes that the federal administration's decisions to shutdown or derail resource development violate federal law. For example, the state has filed lawsuits against the federal government protesting the de facto North Slope OCS moratorium, ESA listings, and critical habitat determinations.

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[2] These decisions range from delays to Shell's offshore exploration plans; a USFWS planning process on the ANWR's coastal plain; a Corps of Engineers rejection of ConocoPhillips'CD-5 development plan at the NPR-A; a marine spatial planning project; proposed "Wild Lands" designation; to decisions under the ESA related to the polar bear.

Another source of the state's frustration centers on the Obama Administration's lack of transparency and the failure to consult with the state prior to making decisions that have a profound impact on the state's economy and its residents. For example, the DOI, prior to announcing an OCS moratorium in a May 2010 press release, failed to consult with the state. The administration's failure to provide such notice violates federal law. Similarly, I met with a senior DOI official to specifically request that the administration provide more notice to the state and allow for state input before taking adverse actions that impact our interests. Twelve hours later, after being assured we would be given notice on future decisions affecting Alaskans, DOI announced a new Wild Lands policy without any notice or input from the state.

IX. The State of Alaska Wants to Partner with the Federal Government to Increase TAPS Throughput to One Million Barrels Within a Decade to Help Reduce the Country's Import of Foreign Oil

The State of Alaska will continue to defend Alaska's interests by trying to persuade the federal government to abandon its anti-development policy in Alaska. Where persuasion fails, we will continue to litigate such matters. In so doing, we strongly believe that we are also defending and promoting broader American interests. All Americans should be concerned about federal government policies that undermine U.S. interests across such a broad spectrum of critical areas. In particular, the viability of TAPS as a continuing critical component of our nation's energy security infrastructure is an issue for all Americans. It is on this issue that the federal government can play a critical role.

Although both economics and federal policies are in play, the viability of TAPS is more of a political issue than an economic one. As a threshold matter, Alaska's North Slope has huge reserves and it is still relatively underexplored. Thus, the issue of TAPS' viability does not center on whether we have enough hydrocarbons to entice investment. With $100/barrel oil, predictions that oil prices will remain over $80-$90 for much of the decade, and Alaska's existing infrastructure to transport hydrocarbons, the viability of TAPS is clearly not solely economic.

The State of Alaska is also doing as much as we can to make oil production on state lands as globally competitive as possible. The Governor's major tax reform legislation will do much to get us to such a position.

For these reasons, the long-term viability of TAPS will primarily be determined by federal politics and policies. The federal government's antidevelopment policies throughout the North Slope chill the investment climate and discourage companies from exploring and producing in Alaska. When Shell cannot drill one exploratory well in the OCS after five years of spending billions of dollars for leases and permits, and ConocoPhillips cannot get a permit, again after five years, to build a bridge across the Colville River to access CD-5 in the NPR-A, it is the federal government that is denying access to abundant hydrocarbon resources and, ultimately, jeopardizing the long-term viability of TAPS.

These are just a few examples of many where federal policies have focused on discouraging—not encouraging—the billions of dollars of investment needed to increase North Slope oil production. If we had a federal government that welcomed exploration and development and permitted operations in a timely and predictable manner, the economics of filling TAPS would take care of itself.

The Federal Government Should Embrace the State of Alaska's Goal of Increasing TAPS Throughput to 1 Million Barrels Per Day as National Policy

Our preferred approach is to have a federal government that joins us in the mutually beneficial goal of responsible resource development in Alaska.

As noted above 12, on March 30, 2011, Governor Parnell announced an ambitious but critical goal for Alaska and the country to increase the Trans Alaska Pipeline System (TAPS) throughput to one million barrels of oil production per day within a decade. On the same day, President Obama announced his goal of reducing oil imports by one third by 2025. The State of Alaska fully endorses President Obama's goal. Indeed, just this past Monday, Governor Parnell reached out to President Obama expressing Alaska's support for this important goal while at the same time asking the President to support the state's goal to increase TAPS. More specifically, Governor Parnell respectfully requested that the President direct his Secretaries of Interior and Energy, as well as the EPA Administrator, to work with Alaska on refining a plan that will enable Alaska and the rest of the country to achieve the goal established by the President.

The State of Alaska would also welcome Congress's involvement in ensuring that the federal government supports Alaska goal of one million barrels a day through TAPS within a decade. By working together to champion such a goal, as well as the President's goal of reducing oil imports by one third, we can demonstrate how state and federal governments can come together to curb our dependence on foreign oil and create a brighter, more secure future for Americans.

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April 11, 2011

The Honorable Barack Obama
President of the United States
The White House
1600 Pennsylvania Avenue, NW
Washington, DC 20500

Re: Goal to Reduce Oil Imports

Dear Mr. President,

I was pleased to see your recent goal to reduce the nation's oil imports by one-third by 2025, and I have publicly commended you for it. With energy prices surging and manufacturing and transportation costs rising, the high cost of goods impacts every American, putting our economic recovery at risk. Achieving your goal would put our nation on track to create additional jobs and greater economic opportunity for all.

If we are to reach the goal of cutting oil imports by one-third, Alaska will have to play a critical role – and we are clearly positioned to do so. On March 30, 2011, I announced an ambitious goal for Alaska and the country to increase the Trans Alaska Pipeline System's (TAPS) throughput to one million barrels of oil production per day within a decade. Current production through TAPS is about 640,000 barrels per day, which is down from two million barrels per day 20 years ago. TAPS is a critical component of our nation's energy infrastructure. As throughput declines continue, pipeline operational challenges increase, particularly during winter. Our goal of one million barrels a day through TAPS within a decade is vitally important.

For the nation to achieve your goal, we must obtain new production from both federal lands and State lands in Alaska. The North Slope of Alaska, both on and offshore, which currently accounts for approximately 12 percent of United States domestic oil production, remains a world class hydrocarbon basin by any measure. According to the United States Geological Survey (USGS), the North Slope of Alaska is estimated to hold about 40 billion barrels of oil and 236 trillion cubic feet of natural gas. In addition, the North Slope is estimated to have billions of barrels of heavy, viscous, and shale oil.

As a state, we are doing all we can to increase responsible oil production to one million barrels per day within ten years. We are in the process of modifying our fiscal system to make Alaska more globally competitive in order to attract investment. We are also undertaking other major reforms to increase responsible production in Alaska, such as building infrastructure to critical resource areas of the state and reforming our permitting system. And, of course, we will maintain strict environmental protection standards which are the hallmark of responsible development on the North Slope. However, reaching Alaska's goal of increasing oil production requires federal movement. Some of the most promising oil and gas fields in North America lie on federal lands on the North Slope of Alaska, including the National Petroleum Reserve-Alaska, the Arctic Outer Continental Shelf, and the Coastal Plain of ANWR. Currently, exploration and development in each of these federal areas is blocked by federal action or inaction. Without access and timely, predictable federal permitting, it will be much more challenging for your national goal of reducing oil imports by one-third, and we will not meet my goal to increase TAPS throughput to one million barrels per day.

Mr. President, I fully support your goal of reducing foreign imports of oil by one-third, and I am asking you and your Administration to expressly support Alaska's goal of increasing TAPS throughput to one million barrels a day. More specifically, I am respectfully requesting that you direct your Secretaries of Interior and Energy, as well as your EPA Administrator, to work with our Alaska administration and the rest of the country to achieve the goals established.

Together, we can demonstrate how State and federal governments can come together on mutually aligned goals, curb our dependence on foreign oil, stimulate our economy, and create a brighter, more secure future for Americans.

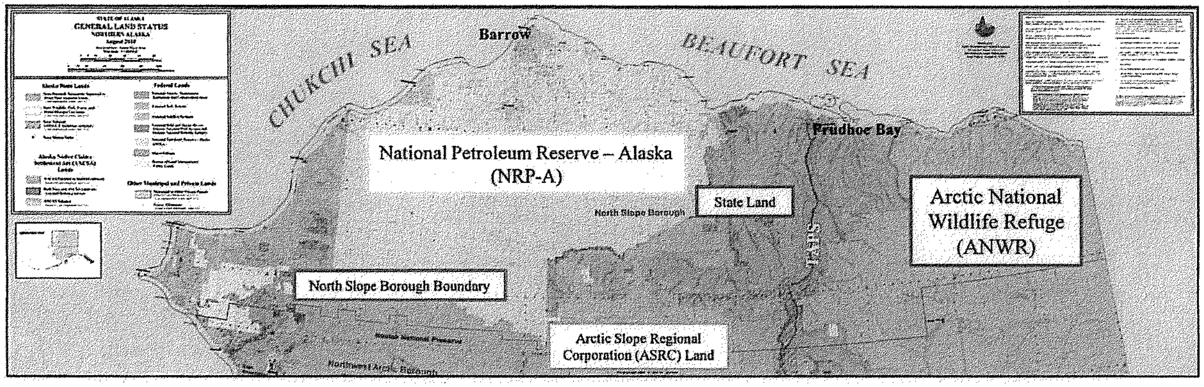
Regards,

Sean Parnell

Sean Parnell
Governor

cc: The Honorable Gary Stevens, Senate President, Alaska State Legislature
The Honorable Mike Chenault, Speaker of the House, Alaska State Legislature
The Honorable Dan Sullivan, Commissioner, Alaska Department of Natural Resources
The Honorable Larry Hartig, Commissioner, Alaska Department of Environmental Conservation
John Katz, Director of State/Federal Relations and Special Counsel, Office of the Governor

Land Status on the North Slope


CHUKCHI SEA
Barrow
BEAUFORT SEA
Prudhoe Bay
National Petroleum Reserve – Alaska (NRP-A)
State Land
North Slope Borough
TAPS
Arctic National Wildlife Refuge (ANWR)
North Slope Borough Boundary
Arctic Slope Regional Corporation (ASRC) Land
Northwest Arctic Borough
STATE OF ALASKA
GENERAL LAND STATUS
NORTHERN ALASKA
Alaska State Lands
Federal Lands
Alaska Native Claims Settlement Act (ANCSA) Lands
Other Municipal and Private Lands

Mr. WHITFIELD. Mr. Sullivan, thank you very much. Mr. Lawrence, you are recognized for 5 minutes.

STATEMENT OF DAVID LAWRENCE

Mr. LAWRENCE. Thank you, Mr. Chairman, members of the committee. I appreciate the opportunity to speak to you today. I have been asked to talk about Shell's Alaska exploration program and the regulatory challenges that have blocked it.

Mr. WHITFIELD. Is your microphone on, Mr. Lawrence?

Mr. LAWRENCE. Thank you, Mr. Chairman. First, let me make three points. Our Nation needs oil and gas. Second, Alaska's Outer Continental Shelf has world-class resources. Third, developing these resources has broad and long-term benefits. It is widely recognized that the world's demand for energy will double by 2050 and to meet it, we will need all forms of energy.

Government estimates say Alaska's offshore holds at least 27 billion barrels of oil and it may be much, much more. We can't know until we can actually explore with the drill bit. We have been ready to do that since 2007. However, we have been blocked by regulatory barriers. One of the most frustrating, the inability to get a usable air permit from the EPA. This is a concern for Shell, but more importantly, it is a concern for the Nation.

Put simply, Alaska's OCS is an imperative for energy supplies, the economy, and national security. Developing Alaska's resources will contribute substantially to meeting the energy needs of America's consumers and America's businesses. It is not unreasonable to assume that production from Alaska's OCS will ready 700,000 barrels per day for 40 years. That is equivalent to the 2010 oil imports from Iraq and Russia combined. In 2030, some have estimated that peak production could be over 1.4 million barrels per day. And that is more than our 2010 imports from either Saudi Arabia or Nigeria.

Reducing foreign imports has immediate economic benefits. The balance of trade will improve. U.S. dollars will remain here in our own economy. Alaska's OCS development will create an average of nearly 55,000 jobs per year for generations. These are long-term, well-paying jobs both in Alaska and the lower 48. It will generate conservatively $197 billion in government revenue from royalties and taxes. The oil will move through the Trans-Alaska Pipeline, which continues to be a major supply line to the lower 48. Without additional production in Alaska, this critical infrastructure will collapse and we cannot stand by and allow this.

Regulatory barriers that undermine the Nation's oil and gas leasing program should be a concern to policymakers. Consider the facts. At the government's invitation, Shell participated in offshore lease sales in Alaska. We paid the government more than $2 billion for those leases and invested more than $1.5 billion to prepare for an exploration program that meets and exceeds all regulatory requirements. But despite our most intense efforts, we have yet to drill a single well. This is highly unusual. When the Federal Government holds a sale, it is saying OCS exploration and development is desired. If a company presents a plan that meets all regulatory requirements, that plan should be permitted.

Unlike a development and production program, exploration here is a temporary, short-term operation. Our initial Alaska wells will each take just 30 days to complete. Data will be gathered and the well will be permanently plugged and abandoned. These are not complex wells. The wells in Alaska's OCS are vastly different from those in deeper water, specifically in terms of water depth and reservoir pressure. Much lower pressure means the mechanical barriers in Shell's well designs will have even greater safety margins and much lower risk profiles than we see elsewhere in the deepwater Gulf.

Still, Shell has assembled an unprecedented oil spill response capability. And there is no question that the bar should be high in the Arctic. We support high standards and a robust permitting process. But the process must work. And the EPA permitting process has failed. The emissions from our program pose no threat to human health. The EPA administrator herself stated this during a recent Senate hearing.

No company should endure the delays and waste we have experienced over the last 5 years. Certainly, this is an area that Congress should address. First, Congress should clarify where emissions from an OCS facility should be measured. For onshore facilities like a manufacturing plant, emissions are measured generally at what is referred to as "the fence line." Offshore drilling ships have no fence lines and the public is many, many miles away.

Second, Congress should provide a clear definition for the point in time when a drilling vessel becomes regulated by the Clean Air Act.

And third, Congress should require EPA to take final agency action on an OCS air permit within 6 months of receiving a complete application and should centralize any potential judicial review of final permits in the D.C. Court.

Thank you, and I look forward to answering your questions.

[The prepared statement of Mr. Lawrence follows:]

Statement of

David Lawrence

Executive Vice President, Exploration & Commercial

Shell

before the

Energy and Power Subcommittee

of the

House Energy and Commerce Committee

Wednesday, April 13, 2011

Summary

Shell has been prepared to explore in Alaska's OCS since 2007, but regulatory and legal challenges have prevented the drilling of a single well.

Alaska OCS holds an estimated 27 billion barrels of oil and more than 120 trillion cubic feet of gas.

Benefits of developing the Alaska offshore include reducing imports; extending the life of TAPS; creating 54,700 jobs per year, $145 billion in payroll and $193 billion in government revenue by 2057.

Shell's Alaska exploration program, unlike a development and production program, is a temporary, three-month, short-term operation. The shallow water, low pressure Alaska OCS wells differ significantly from Gulf of Mexico deepwater exploratory wells; and the oil spill prevention, containment, mitigation and response plans are robust and comprehensive.

The federal government held OCS lease sales in Alaska, a decision that indicates exploration and development is desired. Shell participated and paid nearly $2.2 billion for 10-year leases, but the government's permitting and regulatory process has not been equipped to deliver.

The government has a responsibility to the leaseholder when it holds an OCS lease sale. Companies will not bid on leases if the government is not prepared to do the work that allows for exploration and development.

Shell fully supports a regulatory process that is thorough, competent and robust. It must also be fair and lead to timely decisions. Of the 35 permits needed for the program, most are issued without delay; some are not.

After five years, EPA has not issued a useable air permit for Shell's temporary, mobile source of emissions. The EPA Administrator testified that the emissions do not present human health concerns.

EPA has little or no experience with OCS oil and gas activities and has failed to set clear guidelines for issuing air permits for offshore oil and gas facilities.

Federal agencies should have funding to do permitting work in a timely and thorough manner.

Congress should ensure that OCS air permitting is rational by making clear that:

- The focus is on the air quality at onshore locations, not air quality at offshore locations. This is consistent with the purpose of the Clean Air Act, i.e., to protect public health and the environment.
- The drilling vessel becomes a "source" to be regulated when it begins drilling. Further, while the emissions of vessels associated with and operating near the drilling rig are considered when analyzing the impact of the drill rig on air quality, those vessels are regulated as mobile sources.
- EPA should take final agency action within six months of receiving a complete application, which would provide for judicial review of final permits in the D.C. Circuit Court of Appeals.

Introduction

Mr. Chairman and members of the Committee, I appreciate the opportunity to testify today. I would like to thank the Chairman for having this hearing to examine the resource potential in Alaska's Outer Continental Shelf (OCS).

I am Executive Vice President of Shell Exploration and Commercial. I lead a team of professionals who identify, invest in and explore for oil and gas resources around the world. The Arctic, including Alaska's offshore, holds world-class resource volumes. That is why Shell has invested in leases off the coast of Alaska.

Alaska can play a major role in meeting the energy needs of American consumers and American businesses but achieving that result requires action and political will. Developing Alaska's OCS will also create thousands of jobs; hundreds of billions in revenue for local, state and federal coffers; reduce imports; improve the balance of trade; and extend the life of the Trans-Alaska Pipeline System (TAPS).

Shell has been prepared to explore in Alaska's OCS since 2007, but regulatory and legal challenges have prevented us from drilling even a single well. In the five years since first seeking to explore in Alaska, Shell has drilled over 400 exploration wells around the world. I remain hopeful that the barriers to exploring in Alaska's OCS will be addressed in the short term.

Today I will discuss:

- Global energy demand forecasts, and the fact that oil and gas will play a critical role in meeting future energy needs and in fueling the economy.
- Alaska's OCS resource potential, and the benefits to the nation of developing those resources.
- Shell's proposed exploration program in Alaska, and the challenges that have blocked the program.
- And finally, some recommendations for moving forward.

Global Energy Demand

The world must grapple with the reality that global energy demand is projected to increase by roughly 50 percent over the next 20 years and could double by 2050. As the global recession fades and economies recover, demand will accelerate. A key driver will be strong economic growth and a vast, emerging middle-class in the developing nations.

To address this demand, we will need all sources of energy - hydrocarbons, alternatives, renewables and significant progress in efficiency. Oil and gas will be the dominant energy source for decades. Renewables and energy efficiency will play an ever-increasing role. Shell is actively pursuing research and development into next generation biofuels. We also have a wind business in North America and Europe, for which I am responsible.

Future growth for alternative energy forms will be paced by the speed of technological development, public and private investment capacity, government policies, and the affordability of energy supply. Still, it takes several decades to replace even one percent of conventional energy with a renewable source. The effort to tip the scale towards more renewable sources of energy is worthwhile but even unprecedented growth in renewables would leave an enormous energy gap that must be filled with oil and gas.

As we move to meet the world's energy needs, environmental challenges must be met and policies kept in place to ensure responsible energy development. We must recognize and provide the amount of energy that will be required to grow the economy; and also have a framework in place that ensures we do so in an environmentally sustainable way.

Governments have a role to play in defining the policies that will foster a viable, efficient and workable marketplace that allows technology and innovation to move forward. Industry – and most particularly the energy industry – has an important role to play as well. Human ingenuity combined with business acumen and political will has helped us clean up rivers, improve air quality, and make acid rain a thing of the past. This same human ingenuity will solve the issues of the future even as we power our economy.

U.S. Oil and Gas Resource Potential

The President recently acknowledged that reducing dependence on imports was a national policy imperative. We agree. The U.S. is resource-rich in many ways, especially in oil and gas. Yet, the U.S. imports more than 60 percent of its petroleum.

Consider the enormous costs created by importing oil. According to the EIA:

- Liquid fuel net imports will average 9.7 million bbl/d in 2011 and 10 million bbl/d in 2012, comprising 50 percent and 52 percent of total consumption, respectively.
- Imports cost the U.S. more than $350 billion last year.

I applaud the President for highlighting the need to reduce imports. Producing more oil and gas in our own country is a "win-win" proposition. It provides real economic and security benefits. With increased domestic production, less money is exported from the U.S., more money is invested in the U.S. and federal revenues increase through royalties and taxes. This can be done in a way that provides appropriate environmental protections based on solid science and an understanding of ecosystems and the impact of oil and gas activities on them.

I offer an example from the OCS:

According to the U.S. government, 420 trillion cubic feet of natural gas and more than 86 billion barrels of oil are yet to be discovered on the OCS, including Alaska. To put that into perspective, that is enough natural gas to heat 100 million homes for 60 years and enough oil to fuel 85 million cars for 35 years.

The greatest offshore resource potential lies in four key areas: the Gulf of Mexico, Alaska and the Atlantic and Pacific Coasts.

- **Gulf of Mexico -** This has been the heartland of U.S. offshore activity. The industry has been in the Gulf for more than 60 years, producing more than 10 billion barrels of oil and more than 73 trillion cubic feet of natural gas. Estimates state there are at least 45 billion barrels of oil and more than 233 trillion cubic feet of gas remaining.

- **Alaska OCS - World Class Potential -** The Alaska offshore likely holds some of the most prolific, undeveloped conventional hydrocarbon basins in North America. Conservative estimates from the Bureau of Ocean and Energy Management Regulation and Enforcement (BOEMRE) place roughly 27 billion barrels of oil and over 120 trillion cubic feet of gas in the Alaska OCS.

- **Atlantic and Pacific Coasts –** Assessments of these areas have not been updated in decades, but the estimate is that the Atlantic Coast holds 4 billion barrels of oil and 37 trillion cubic feet of gas and the Pacific Coast holds 10 billion barrels of oil and 18 trillion cubic feet of gas.

History of Alaska OCS

The world has long been aware of the Arctic's vast resources. In total, more than 500 exploratory, production, and disposal wells have been drilled in the Arctic waters of Alaska, Canada, Norway and Russia. As a result of federal OCS lease sales in the 1980s and 1990s, more than 35 wells have been safely drilled in the U.S. Beaufort and Chukchi Seas.

Shell is proud of its offshore legacy in Alaska, having produced in the state waters of Cook Inlet in Alaska for more than 30 years beginning in 1964. In the late 1970s and mid 1980s, Shell drilled exploration wells offshore in the Gulf of Alaska, St. George Basin and the Bering Sea. In the late 1980s and early 1990s, Shell drilled several exploration wells in the Beaufort Sea and later drilled four of the five exploration wells ever drilled in the Chukchi Sea.

Although oil and gas were found, Shell chose not to proceed to development. We plugged and abandoned those exploratory wells for economic reasons – including the fact that, at that time, TAPS was already running near capacity.

Since 2005, the federal government has held several more OCS lease sales in Alaska. Shell participated in these lease sales and in fact, is now the majority leaseholder in the Alaska offshore. Shell has paid the federal treasury nearly $2.2 billion for ten-year leases in the Beaufort and Chukchi Seas. Additionally, Shell has invested more than $1.5 billion and six years preparing for an exploration drilling program with unparalleled mitigation and safety measures. Shell's work includes multiple years of 3D seismic data collection, first-of-its-kind baseline science, shallow hazard surveys, geotechnical programs, numerous social investment initiatives and hundreds of meetings with North Slope residents.

The Benefits of Developing the Alaska Offshore

The benefits of developing Alaska's offshore oil and gas resources are many - not only to Alaska, but also to the Lower 48. Development would be an economic engine for decades to come.

The jobs growth and economic benefits of Alaska OCS exploration and development are well understood. A study conducted in 2010 by Northern Economics and the Institute for Social and Economic Research (ISER) at the University of Alaska details the potential national benefits of developing the oil and gas resources of the Alaska OCS:

- An annual average of 54,700 new jobs would be created and sustained through the year 2057, with 68,600 jobs created during production and 91,500 at peak employment;
- A total of $145 billion in new payroll would be paid to employees through the year 2057, including $63 billion to employees in Alaska and $82 billion to employees in the rest of the U.S.; and
- A total of $193 billion in government revenue would be generated through the year 2057, with $167 billion to the federal government, $15 billion to the state of Alaska, $4 billion to local Alaska governments, and $6.5 billion to other state governments.

Several important implications for national policy and domestic supply are raised in the study including:

- Alaska OCS development maximizes the value of Alaska's and the nation's oil and gas resources by enhancing both value and volume: reduced transportation cost (from existing infrastructure operating below capacity) enhances value, and expanded infrastructure enables development of satellite fields; and
- Alaska OCS development can help extend the operating life of TAPS and increase the probability of an Alaska gas pipeline due to greater certainty of the available gas resource base to fill it.

To elaborate, Alaska's OCS likely has at least a third more oil than has been produced in Prudhoe Bay, moved through TAPS and used to fuel the U.S. for the past 30 years. It is two and a half times what has been produced in the Gulf of Mexico since 1990.

An independent assessment of industry-wide development of Alaska's Beaufort and Chukchi Sea OCS found that an average of just under 700,000 barrels of oil per day would be produced for 40 years. This is equivalent to our 2010 oil imports from Iraq (506,000 bbl/day) *and* Russia (137,000 bbl/day) combined. This same study found that production would peak at 1.45 million barrels of oil per day in 2030 (and 2.1 billion cubic feet of gas per day in 2050). This is more than our 2010 oil imports from Mexico (1.03 million bbl/day), Saudi Arabia (958,000 bbl/day), Nigeria (996,000 bbl/day), or Venezuela (827,000 bbl/day).

An additional average increased production of 700,000 barrels of oil per day for 40 years, at a peak production of 1.45 million barrels per day is no small feat. It is tantamount to eliminating the need for imports from one of our largest foreign suppliers. This is especially helpful in a world of increasing geopolitical instability.

Domestic energy production is critical for the security and prosperity of the U.S. Money spent on domestic energy cycles in the U.S. economy, increases domestic economic activity and jobs. Alaska OCS activity will also help address our national debt, bringing in hundreds of billions in federal revenues from taxes and royalties from oil and gas production and the economic activity that is stimulated as a result.

A major benefit from Beaufort and Chukchi development would be the long-term viability of TAPS. Since 1977, Alaska has supplied the U.S. and its refineries with vast quantities of domestic oil via TAPS, totaling roughly 17 billion barrels through 2010. The construction and operation of the pipeline has also provided hundreds of thousands of high paying jobs in Alaska and the nation, helping to lift America out of one of its worst economic downturns. A generation of Americans worked on building TAPS and it remains an economic engine as well as a symbol of American know-how and ingenuity.

Unfortunately, production in Prudhoe Bay has fallen significantly in recent decades. At its height, the pipeline supplied the nation with 2.1 million barrels of oil per day or about 1/3 of the nation's oil production.

Today TAPS supplies only 600,000 barrels per day; about 11 percent of our domestic supply. If the throughput in the pipeline continues to decline and no new supplies are found, it will eventually be shut down, cutting access to one of the largest sources of domestically produced oil in the country. This would quickly accelerate our already increasing dependence on imported oil and negatively impact the U.S. balance of payments and federal revenues. Production of Alaska's oil has provided tens-of-billions of dollars in tax revenues and will in the future, but only if it remains viable.

The recent temporary shutdown of TAPS had an immediate impact on crude prices, jeopardized the continuity of the U.S. West Coast refinery infrastructure, and resulted in a spike in U.S. reliance on Russian crude supplies. This could be a harbinger of things to come.

Fortunately, the U.S. has an opportunity to prevent this scenario from reoccurring. According to Northern Economics and ISER at the University of Alaska, if OCS oil is transported through TAPS, the higher volume of throughput would reduce the TAPS tariff and would extend the life of TAPS for decades. Doing so would require a major pipeline expansion to meet offshore pipelines in Camden Bay and in the Chukchi Sea. Those projects would certainly rank among the largest private sector construction projects in U.S. history.

It is clear that resource development, such as OCS oil and gas production, is the first step in wealth creation. It has an enormous economic multiplier. Jobs and revenues created by oil and gas development have strong reverberations across our economy, producing long-term high paying jobs. It creates a need for domestic manufacturing capabilities, steel production, transportation, infrastructure development, electronics and high-tech components. Alaska OCS development is a genuine long-term economic stimulus plan.

Finally, by exploring and developing our OCS resources, the U.S. has an opportunity to reaffirm its global role as an Arctic nation. It is no secret that the Arctic is becoming a critical location from a geopolitical and strategic perspective. Arctic nations are increasingly interested in international boundaries and opportunities for resources and economic development.

Recently, Norway and Russia signed a maritime border delimitation agreement that settled a long-standing seaward boundary dispute in the Barents Sea. The stimulus for the agreement was mutual cooperation that would allow the development of offshore Arctic oil and gas resources. Elsewhere, Arctic nations are asserting their claims to continental shelf borders in accordance with the United Nations Convention on the Law of the Sea. Even nations outside the Arctic are positioning themselves for Arctic resource development.

Due to U.S. inactivity, our country risks falling even further behind the rest of the world in developing its Arctic resources. As we are seeing in countries like Norway, Russia, Greenland and Canada, such resources are highly attractive and new exploration is already underway. We have an opportunity to develop our Arctic resources and the infrastructure appropriate to facilitate our Arctic presence.

Offshore Safety Standards

Before moving to a discussion of Shell's Alaska exploration program, it is appropriate to acknowledge the *Deepwater Horizon* incident in the Gulf of Mexico. The incident forced a re-examination of offshore operations and led to new regulatory requirements that have raised the bar on safety. This was appropriate and has resulted in substantial changes in the way the industry operates. There is no question that the industry must be held to the highest standards both for protecting the environment and protecting the health and well-being of our workers and communities in which we operate.

Let me highlight a few of the new regulatory requirements systems adopted by the federal government and industry:

- The Interim Final Drilling Safety Rule is focused on minimizing the likelihood of an incident and addresses barriers that should be in place to prevent a hazard. Preventing an incident is a top priority.
- Responding to an incident is now substantially enhanced with new requirements for containment capability. The Marine Well Containment Company (MWCC), which Shell initially formed in partnership with three other oil and gas companies, is designed to do just that. The MWCC is a stand-alone organization committed to improving capability for containing a potential underwater well control incident in the Gulf of Mexico.
- The industry announced that a new Center for Offshore Safety will be created to promote the safety of offshore operations and enhance the government's regulatory role. The

Center will provide an effective means for sharing best practices. Members will be subject to independent, third-party auditing and verification to ensure integrity. The Center will operate around an existing safety framework created by the American Petroleum Institute in 1993, known as RP75, or "Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities."

- Industry has also significantly increased its resources to respond to a major oil spill by adding vessels, equipment and personnel.

In addition to regulatory requirements, a company must foster and promote safety relentlessly each day. At Shell we call this Goal Zero. Everyone who works for us – both employee and contractor – are expected to comply with the rules; intervene when anything looks unsafe; and respect people, the environment and our neighbors. Compliance is not optional.

We have personal safety systems and procedures with clear, firm rules; simple "do's and don'ts" covering activities with the highest potential safety risk, such as getting proper authorization before disabling safety-critical equipment and protecting against falls when working at heights.

We have process safety systems to ensure the safety and integrity of our operations and assets. Process safety is also managed through a variety of tools, such as well and facility design standards; established "operating envelopes" not to be exceeded; maintenance and inspection intervals for safety critical equipment; and an effective Management of Change process.

Our approach also requires that all contractors, including drilling contractors, develop a Safety Case to demonstrate major risks are properly managed. A Safety Case in deepwater drilling shows how we identify and assess the hazards on the rig; how we establish barriers to prevent and control the hazards; and how we assign the critical activities needed to maintain the integrity of these barriers. Further, it guides the rig and crews in risk management; and ensures staff competency, especially for those new to the rig.

Shell's Alaska Exploration Program

Shell is planning an offshore oil and gas exploration program in 2012 during the three-month open water season. This program could include drilling multiple wells in both the Beaufort and Chukchi Seas, site clearance surveys and baseline science studies. It is important to note that an exploration program, unlike a development and production program, is a temporary, short-term operation. In the Alaska OCS, an exploration well is anticipated to take approximately 30 days to complete, at which time the well will be permanently plugged and abandoned and the site cleared. Shell's exploration program will meet or exceed all applicable regulatory requirements for the protection of health, safety and the environment.

Shell is committed to employing world-class technology and experience to ensure a safe, environmentally responsible Arctic exploration program – one that has the smallest possible footprint and no negative impact on North Slope stakeholders or traditional subsistence hunting activities. Aspects of the 2012 program have been under evaluation by federal agencies since 2006. At every step, Shell has worked with federal agencies, the State of Alaska, and local communities to develop a program that achieves the highest technical, operational and environmental standards.

I will discuss here:

1. The currently available science regarding the Arctic is extensive and more than adequate for an exploration program;
2. The shallow water, low pressure Alaska OCS wells differ significantly from Gulf of Mexico deepwater exploratory wells; and
3. The oil spill prevention, containment, mitigation and response plans included in Shell's 2012 Arctic exploration plan are robust and comprehensive.

Arctic Baseline Science

Some argue that there is insufficient scientific data regarding the Arctic and, therefore, exploration in the Chukchi and Beaufort Seas should not go forward. This is not accurate. In fact, the available scientific data is more than adequate to identify and evaluate the impacts of an exploration program that is, by definition, a short-term, temporary operation.

Several thousand environmental, ecological, and socio-economic studies applicable to oil and gas activities in the Arctic OCS have been completed over the last 30 years. The categories of scientific data available include: tides and ocean currents, weather (e.g., wind and its effect on currents, precipitation), ice conditions, baseline environmental data related to species found in the arctic (e.g., benthic, fish, birds, marine mammals, etc.), assessments regarding the impacts of oil and gas exploration activities on those species, and, specifically, information assessing the impacts of an oil spill on those resources, in the highly unlikely event of an incident during exploration drilling.

Since 1973, federal agencies have performed more than 5,000 environmental studies to better understand the Alaska OCS and coastal environment, and document or predict the effects of offshore oil and gas activities. The former Minerals Management Service Environmental Studies Program spent more than $600 million dollars (more than $1 billion in inflation adjusted dollars) for studies under the guidance of the OCS Scientific Committee, which advises the Secretary of Interior. About half of these funds have been directed to Alaska.

The advancement of scientific knowledge will continue. This expanded knowledge is critical because it informs government regulators who must issue permits, it informs policymakers who must develop sound energy and environmental policy and it informs our operational decisions. In fact, Shell is contributing to advancing Arctic science in several ways. Since returning to Alaska in 2005, Shell has spent $60 million engaging in an aggressive environmental studies program in the Arctic offshore. Shell has worked in a collaborative manner with a wide range of stakeholders, including industry partners, local, state, and federal governments, universities, and non-government organizations to share resources and facilitate the further development of our understanding of the Arctic marine ecosystem.

Shell has also taken the lead in the development and implementation of new technologies, including unmanned aerial systems, acoustic recorders, and integrated ecosystem studies to advance capacities to work in this challenging offshore environment. Shell fosters and funds such diverse research as computer assisted identification of marine mammal calls, greatly enhancing the capacity to utilize acoustic sampling technologies, satellite tagging, ice and weather forecasting and physical oceanography.

Recently, the North Slope Borough (NSB) and Shell entered into a multi-year collaborative science agreement that will enable impacted North Slope communities to build capacity for scientific research and independent review of studies, exploration and development plans and regulatory documents. The research program established under this agreement will be guided by an Advisory Committee of representatives from each of the coastal communities (Point Hope, Point Lay, Wainwright, Barrow, Nuiqsut and Kaktovik), scientists from the NSB and Shell, and independent scientists. This committee will be responsible for identifying critical issues, setting investigative priorities, and integrating traditional knowledge with science. The current agreement is between the NSB and Shell, but it anticipates expansion of the studies program through additional funds from third parties, which may include either private or public sources.

If exploration leads to a commercial discovery, even more science will be needed. Consistent with the Outer Continental Shelf Lands Act's (OCSLA) multi-stage process, development and production activities will build on the information gathered through the exploration stage. The first development in the Arctic OCS will require the preparation of an additional environmental impact statement. The issues to be addressed in that document will be determined during a public scoping process. Since 2006, Shell has spent almost $90 million pre-investing in data acquisition, studies and research and development that will support environmentally sound offshore development. Information gathered during these earlier OCSLA stages (including exploration) will form the basis for that scoping process, as well as the identification of any issues that may require additional research or study before informed decision making.

This approach was recently validated in the final version of the President's Oil Spill Commission report where it states, "The need for additional research should not be used as a *de facto* moratorium on activity in the Arctic, but instead should be carried out with specific timeframes in mind in order to inform the decision making process."

Exploration in Alaska's OCS vs. Exploration in Deepwater Gulf of Mexico

The drilling conditions for Shell's proposed 2012 Alaska OCS exploration program are typical of wells that have been safely and effectively drilled for more than 30 years. The Alaska OCS wells are in shallow waters and have much lower downhole pressure, which is vastly different from the conditions found in the deep waters of the Gulf of Mexico. This increases the safety margin.

The *Deepwater Horizon* was drilling the Macondo well in 5,000 feet of water and down to a depth of 18,000 feet. The pressure encountered in the Macondo well was about 15,000 psi based on mud weight at total depth. The water depth, well depth and pressure make the Macondo well and other deepwater Gulf of Mexico wells far more technically complex than the shallow wells that will be drilled off the coast of Alaska.

In Alaska's Beaufort Sea, the wells will be in 150 feet of water or less. The wells will be between 7,000 to 10,000 feet deep. We have extensive reservoir pressure models based on previously drilled wells in the Chukchi and Beaufort Seas that show the pressure at total depth in our initial exploration wells will be no more than 6,000 psi, less than one-third the pressure of Macondo.

With lower anticipated bottomhole pressure in the Alaska wells, all of the mechanical barriers in Shell's well design have higher overall safety margins between operating pressure and mechanical barrier design pressures. Even if the riser from the drill rig to the blow-out preventer on the seafloor was breeched, as it was in Macondo, the weight of the drill mud in the downhole pipe would maintain well control and prevent a blowout from happening. To reiterate, Shell's 2012 Arctic well program is exploratory. The well will not be converted to a production well. It will be permanently plugged and abandoned per federal regulations.

Oil Spill Prevention and Response

Oil spill prevention and response planning is a top priority. Shell's Oil Discharge Prevention and Contingency Plan is robust. We have invested in an unprecedented oil spill response capability to support our drilling plans in the Beaufort and Chukchi Seas. Our spill recovery equipment is state-of-the-art, widely acknowledged by experts as proven and effective under cold-climate conditions and designed to remove the worst-case discharge.

Specifically, Shell has developed a three-tier or layer system for use in the Alaska OCS.

1. The first tier is located on site, always less than an hour from the drilling rig. It is a dedicated fleet of purpose-built vessels and specialized oil containment equipment, which will be on-site 24/7 before a drill bit ever touches the sea floor.
2. The second tier is located to capture oil that might move away from the drill rig.
3. The third layer involves pre-staged shoreline protection. This, along with the first two tiers involves extensive use of both local residents and traditional knowledge.

Shell's oil spill response personnel routinely practice and conduct spill response drills. The response system consists of dedicated oil spill response assets including: offshore recovery vessels with skimmers and boom, near-shore barges with skimmer and boom, shallow water vessels with skimmers and boom, pre-identified protection strategies and equipment for environmentally and culturally sensitive sites, as well as onshore oil spill response teams to deploy and support the above. These assets are staffed during operation around the clock with trained crews provided by Alaska Clean Seas, Arctic Slope Regional Corporation, and Ukpeaġvik Iñupiat Corporation.

Design Prevention, Containment and Spill Response

Shell has design standards and practices that have enabled us to safely drill many deepwater and shallow water wells worldwide in a variety of conditions, including the Arctic. Shell will rigorously apply these standards in all well operations on the Alaska OCS. As described above, the conditions of the well mean that prevention through the mechanical barriers built into the design have a high margin of safety.

The blow out preventers (BOP) that Shell will use have been extensively maintained, inspected and tested by third party specialists. The BOPs have been validated to comply with the original equipment manufacturer specifications, in accordance with API Recommend Practice No. 53. Shell's BOPs will comply with all regulatory requirements.

We will also retain the ability to mechanically cap the well in the unlikely event of a BOP breach. In fact, all existing Shell wells, in deep water, around the globe, can be capped. The design and construction of these wells allows them to withstand the pressure build-up that results when the well is capped. If the blow-out maintains mechanical integrity in the borehole and wellhead, a "capping and containment" operation would be employed. Mechanically capping the well, for example with an additional pre-engineered BOP, has the ability to reduce or even stop the flow, but still requires a surface collection system. The benefit of this response methodology is that it reduces or completely halts the flow of oil entering the water column. This capping method was eventually proven successful in terminating the well bore flow even at Macondo, and has been an integral part of well control descriptions in industry's recently approved permits in the deepwater Gulf of Mexico return to drilling.

In the extremely unlikely event that the wellhead integrity is compromised and an uncontrolled flow occurs, we would employ a pre-fabricated "subsea collection" system. This would consist of a subsea dome located on top of the wellhead, collecting fluids to a surface barge where gas, oil and water can be separated prior to storage and disposal. Separated gas would be flared; separated oil and water would be stored in tanks for subsequent disposal offsite or flared.

Collecting the flowing fluids close to their source of origin prevents or limits the flow of oil into ocean waters, and optimizes the suite of surface oil spill response capabilities by engaging the problem at its source. Surface oil spill response equipment would remain on station in the immediate area. Given we will have two functional drilling vessels in our 2012 exploration operations, each drilling rig will act as the relief backup well drilling unit for the other. Each can immediately stop operations and respond to drill any ultimate relief well.

Oil in Ice

A significant amount of oil-in-ice research has been completed over the last 30 years and more is underway. A four-year program known as the Joint Industry Project (JIP), under the management of SINTEF Norwegian Research Institute, was sponsored by six international oil companies, including Shell, and involved a host of international scientists including those from the Department of the Interior. The purpose was to advance knowledge, tools and technologies for oil spill response in ice-covered waters. The program looked at the fate and behavior of oil spilled in Arctic conditions; the in-situ burning of oil in Arctic and ice-covered waters; the mechanical recovery of oil in Arctic and ice-covered waters; the use of chemical dispersants in Arctic and ice-covered waters; monitoring and remote sensing of oil in and under ice; the preparation of a generic oil spill contingency plan; and field experiments at Svalbard, Norway, in offshore ice-covered waters.

In May 2009, the group spent two weeks in the pack ice in the Norwegian Barents Sea to study the behavior of oil spills in Arctic waters and to test various response options in realistic oil-in-ice conditions. The tests proved that ice acts as a natural boom or protective barrier to confine and reduce the spread of an oil spill and to provide a longer window of opportunity in which clean-up technologies can be used effectively. These tests are the most wide-ranging research and development programs ever undertaken to evaluate Arctic oil spills.

These real-world offshore tests marked the final stage in the largest and most wide-ranging international research and development program ever undertaken to enhance detailed understanding, to further improve and develop spill-response technologies and to increase the ability to react rapidly in the event of an accidental oil spill in ice-covered conditions. The summary of that research showed that by using a suite of available tools (all of which are part of Shell's Alaska tool kit), including Arctic-tested booms and skimmers, and in-situ burning and dispersants, the majority of oil could be cleaned up in a variety of Arctic conditions; including broken ice and slush.

Shell is now leading industry efforts to perform another JIP to continue advancing the technology and research for oil spill response in ice.

Regulatory Challenges

Shell participated in several Alaska OCS lease sales at the invitation of the federal government. Although the leases were issued to Shell, the government's permitting and regulatory process has not been equipped to deliver. As a result, Shell has been blocked from drilling even a single exploration well.

Let me stress that this is *highly* unusual. The federal government's decision to hold a sale is, in effect, a decision that OCS exploration and development is desired. The federal government does years of in-depth analyses before holding an OCS lease sale. Therefore, an exploration or development plan that meets regulatory requirements is permitted. In the case of Shell in Alaska, we have met and exceeded the regulatory requirements and still have not been able to drill a well.

Each of our 414 leases in the Beaufort Sea and the Chukchi Sea has a ten-year term. A lease will expire and return to the federal government at the end of its term, if substantial steps to develop it are not taken.

So, Shell is in a "catch-22." We have invested more than $3.5 billion in leases and in supporting infrastructure -- equipment, support vessels, baseline studies, and workforce training in order to take the first step to explore for oil and natural gas. We have assembled what is arguably the most environmentally sensitive and thoroughly responsible exploration plan in history. Yet, for reasons largely beyond our control, permits have not been issued. Since our leases are only valid for a limited time, we are keen to move forward.

A Robust Regulatory Process

Let me be clear, Shell fully supports a robust permitting process. Permitting work and regulatory requirements protect people and the environment and ensure safe and responsible operations. Shell fully understands the need to provide exploration plans that safeguard the environment and Arctic ecosystem and we are ready to proceed with an exploration program that does precisely that. At the same time, Shell believes the regulatory process should also be thorough, competent and robust. In an era when oil and gas activity is heavily scrutinized, it is critical that the permitting work be done to the letter of the law. Without that, legal challenges are likely and can also act to block a program.

The process should also be valid, fair and lead to timely decisions. Regardless of one's views on oil and gas development, we can all agree that endless delays and inefficiencies in our government are wasteful to the taxpayer and should not be tolerated. Such inefficiencies undermine confidence in the U.S. offshore program and ultimately force investment out of the U.S.; depriving American people of the many benefits I identified earlier --- jobs, economic prosperity and energy security.

Permits Required for Alaska OCS

There are many regulatory agencies at the federal and state level which must review and permit any offshore program. In Alaska, our proposed exploration plan requires more than 35 federal permits from agencies that have a say in what the plan of exploration will look like. Most permits are issued without delay; however, several federal permits have been problematic; none more so than the permit needed from the Environmental Protection Agency (EPA) for air emissions.

History of Shell Alaska Air Permit Efforts

Shell's exploration activity currently involves a temporary, mobile source of emissions. During the five years of working with EPA to obtain permits, we have spent thousands of man-hours and tens of millions of dollars in extensive pre-application consultation, voluntary emissions limitations, significant equipment upgrades, and four separate air permit applications encompassing two different air permitting approaches. Today, Shell still does not have a single effective air permit, despite the fact that the Administrator of the EPA recently testified before the Senate that the emissions from Shell's exploration program off the coast of Alaska do not present human health concerns.

February 2006

- Shell began the initial pre-application dialogue with EPA's Regional Office in Seattle, known as Region 10 or R10. Among the many things discussed was whether to pursue major source or minor source permits. A decision was ultimately made to pursue minor source permitting.

December 2006

- Shell applied to R10 for minor source permitting for two drilling units, the *Discoverer* and *Kulluk*.
- Permits issued in spring 2007; subsequently a request for review was made to the Environmental Appeals Board (EAB). NOTE: The EAB was delegated authority to review air permits by the EPA Administrator. Any person who has commented on the air permit application has standing to request review. The permit cannot be used until 30 days after issuance; and if a review request is filed within those 30 days, it cannot be used until the EAB validates the permit.

September 2007

- EAB remanded both permits to R10. The primary reason for remand was an "inadequate analysis and record support" by R10 on issues related to potential aggregation of separate stationary sources. In other words, the EAB did not deny the permit, but asked for more information to demonstrate decisions made by R10 regarding it.

June 2008

- Nine months after the remand, R10 reissued the *Kulluk* Minor Source permit.
- This permit was again the subject of a request for review at the EAB.

Fall 2008

- While the *Kulluk* minor source permit was pending at EAB, R10 indicated that it no longer felt the minor source permit approach was the best approach for Shell to take regarding its Arctic OCS permitting program.
- R10 advised Shell to seek major source permits, or OCS Prevention of Significant Deterioration (PSD) permits, for its Arctic program.
- In an effort to support this different permitting track, Shell agreed to submit new major source PSD permit applications for the *Discoverer* drill ship. This required that Shell commit $26 million to install selective catalytic reduction and oxidation catalyst on the *Discoverer*.

December 2008

- Nearly three years after our initial dialogue with R10, Shell filed a PSD application for the *Discoverer* drill ship in the Chukchi Sea.
- At R10's request, the PSD application for the *Discoverer* in the Beaufort Sea was held back until May 2009.
- In March 2009, Shell withdrew the *Kulluk* minor source permit while it was still pending at EAB.

March 2010

- After 15 months, R10 issued the Chukchi PSD permit for the *Discoverer*.

April 2010

- After 11 months, R10 issued the Beaufort PSD permit for the *Discoverer.*
- Both *Discoverer* permits were subject to a review request at the EAB.
- Shell requested that EAB expedite review of the permits.

May 2010

- EPA requested that EAB hold the permits "in abeyance" for an indeterminate period, expressing concern about OCS exploration following the BP/Macondo incident.
- After four months of preliminary proceedings, including interim hearings and postponements, EAB ultimately heard oral arguments on three main issues associated with the permits l on October 7, 2010.

December 2010

- EAB remanded the permits as a result of "clear error" on the part of R10. Again, the error by R10 was an inadequate explanation in the administrative record regarding the definition of OCS source, as well as issues related to the R10's insufficient environmental justice analysis. The EAB also alluded to the fact R10 should evaluate whether new air limits proposed after the filing of Shell's permit applications, and effective after the permits were issued by R10 should be used in any reissued permit. Finally, a subsequent ruling by the EAB has added one issue (PM 2.5 analysis) to the list of remanded issues requiring further attention by R10.

In short, the EAB remand of Shell's air permit did not indicate the EPA came to an incorrect conclusion on the impact of Shell's air permit or that our activities would adversely impact the air shed; the EAB simply stated that the EPA did not sufficiently explain how it arrived at certain determinations. It's the roadmap that's in question and as a result, Shell was forced to cancel its 2011 exploration program and cancel tens of millions of dollars in local contracts, in large part because the EPA permits were stalled.

Today, the permits for the *Discoverer* are back in the hands of R10. Shell has filed a minor source permit for the *Kulluk* drill vessel in the Beaufort. Shell is pleased that EPA has dedicated additional resources to the permit work and is hopeful that the permits will be delivered in a timely manner.

What was the Problem at EPA?

Based on the history of dealing with EPA in trying to permit our offshore Alaska program, it seems clear that EPA was not equipped to permit OCS oil and gas activities. Every year, EPA, state and local permitting agencies issue many Clean Air Act permits for major stationary sources. Undoubtedly, some of these permits take considerable time to develop and to gain final approval – but we would estimate that very few of these permits have required the amount of time and expense associated with obtaining a Clean Air Act permit for a single drilling vessel – five years and $50 million dollars.

The contrast between permitting an onshore air emissions source and an offshore oil and gas activity is striking. Let me explain.

In any given year, onshore air emissions permits may be required for major modifications for industrial facilities, changes in large petrochemical facilities, new manufacturing plants and new or modified power plants. The permits may be needed to allow the emission of tens of thousands of tons per year in conventional air pollutants; and a single facility may have scores of separate emission points. All this permitting generates a large, recurring volume of Clean Air Act permitting actions. Those actions involve very complex technical analyses, engineering judgments and the resolution of sometimes difficult legal issues. Yet, most of these permits do move through the Clean Air Act permitting process.

By contrast, permitting the air emissions of an offshore exploration operation with the EPA in the Arctic has proved to be a far more daunting effort than anyone could have imagined when discussions between Shell and EPA began in 2006. The emissions from a temporary, mobile, offshore drilling vessel using diesel-fuel motors and equipment are miniscule in comparison to the emissions from a large industrial facility. In addition, drilling vessels for the most part operate far offshore and away from population centers. In states like Alaska, they are obviously not in or near large urban areas. Even so, we have not received a Clean Air Act permit that can be used to begin drilling.

This contrast between onshore and offshore air permitting is even starker when you consider this: a drilling vessel does not need to have an air permit when it is engaged in normal movement on the water. It only requires an air permit when it attaches to the sea floor, prepares to drill and therefore changes from a sea-going vessel into a stationary "OCS source." At that point, the vessel is subject to Section 328 of the Clean Air Act.

We were heartened by EPA Administrator Jackson's recent statement that Shell's Alaska exploration plan "will not cause air pollution that will endanger public health." But it is simply unacceptable that the process to permit the operation has taken over five years, especially when the Agency itself does not believe there is a serious health threat from vessel emissions.

We believe that there a number of reasons for this excessive delay.

First, as an entity, EPA has little or no experience with OCS oil and gas activities. In the Central and Western Gulf of Mexico, where the overwhelming majority of OCS oil and gas activity has occurred to date, the Clean Air Act provides that the Department of Interior (DOI) reviews air emissions as part of its review of Exploration Plans.

Second, although EPA has held responsibility for permitting OCS activity outside the Central and Western Gulf for over 20 years, the Agency has failed to develop sufficient expertise and failed to set clear guidelines for issuing air permits for offshore oil and gas facilities. Congress recognized this in 2009. In the FY 2010 appropriations bill for the EPA, the Conference Report for EPA's 2010 funding included a clear statement of concern about EPA's inability to deliver offshore air permits and directed EPA to address the issue.

OCS Air Permits

> The conferees are concerned about the ability of the Agency to effectively carry out its responsibilities to process oil and gas permits in the Outer Continental Shelf (OCS) in Alaska and the Eastern Gulf of Mexico. The Agency is directed to allocate sufficient funds and personnel to process OCS air permits in a timely manner consistent with all environmental laws. Within 90 days of enactment of this Act, the Agency is directed to report to the House and Senate Appropriations Committees on its progress to comply with this directive, provide a detailed timeline for issuance of the pending permits, and submit its plan to address this issue consistently among all affected regional offices. Lastly, the conferees expect the Agency to set clear, reasonable national guidelines for issuing OCS air permits." **Conference Report for HR 2996, DEPT OF THE INTERIOR, ENVIRONMENT, RELATED AGENCIES APPROPRIATIONS ACT, 2010, page 45.**

Third, with respect to OCS permits off the coast of Alaska, EPA R10 has limited experience in writing air permits, generally. Under the Clean Air Act, most "new source" permits are written by states which either have delegated air permitting authority or implement their own state program that EPA has approved as part of their State Implementation Plan. Thus, R10 simply has not had the amount of direct CAA permitting experience that would assist them in timely processing OCS permit applications.

Fourth, from our experience, it appears that EPA Region 10 did not have adequate staff levels to process Shell's OCS permits. While this situation may have improved recently, having sufficiently trained staff available for permit review is integral to the process and beneficial to both companies seeking to obtain permits and to the public review process. Further, in developing permits, there needs to be regular interaction and dialogue with reviewing staff to proactively find solutions to any issues that arise – this process can help to produce a permit that meets Clean Air Act requirements, is operationally workable for the permittee and allows for full public participation.

Finally, the EAB process creates uncertainty and delay, particularly given that an air permit cannot be considered "final and effective" until the EAB process is completed. As was stated previously, any commenter has standing to ask for a permit to be reviewed at EAB. Further, other than some time periods for initial filings, the EAB has no mandated deadlines to conduct hearings, or make decisions. In practice this has meant that even after an EPA Regional Office issues a permit, that permit can be ineffective for months or years afterwards as the EAB often issues remand orders and additional reviews are taken. In this regard, I would note that ongoing litigation in the U.S. District Court for the District of Columbia has recently raised the issue of whether the EAB process must be completed with the overall one-year time limit under the CAA within which EPA must issue or deny a final PSD permit.

To be clear, Shell has no desire to lower environmental standards for OCS activities or to not have a fulsome public permitting process. The bar is high in the Arctic and it should be. Instead, we are interested in a regulatory framework that is properly funded, efficient and accountable. For our part, Shell has made clear that we will be responsible for any work we perform on every project in which we participate. Ours is a culture of accountability, safety and respect for people and the environment. Given the chance, we look forward to adding to our excellent record in the Arctic, creating a value proposition for Alaskans and delivering to the nation much-needed domestic supplies of energy.

Recommendations: How Do We Move Forward?

I have discussed the need for and benefits of developing the vast offshore oil and gas resources off the U.S. coast, particularly in Alaska. Now I would like to look forward - to where we go from here and what policymakers should do.

The federal government has a critical role to play as a steward of our oceans. It also has a role to play in supporting the OCS leasing program and the sustainable development of its natural resources.

In areas where OCS leasing has occurred, the government has done literally years of environmental analysis in advance of the lease sale. It has invited companies to buy the leases, and it has accepted bonus bids from companies. In return, the government bears responsibility to the leaseholder. As stated previously, companies will not bid on leases if they believe that the government is not prepared to do the work that allows for exploration and development.

Supporting the leasing program involves a number of potential actions:

- Federal agencies should be adequately funded so that permitting work can be done in a timely and thorough manner.
- Funding for environmental studies and other requirements should be provided, because such work by DOI's Environmental Studies Program and others underpins robust and defensible agency actions.
- Congress should also consider legislative solutions to ensure that OCS air permitting is rational. We believe that the discussion draft circulated in advance of this hearing can help accomplish this end.

First, Congress should clarify the air quality it is seeking to protect when permitting OCS emissions sources. For purposes of OCS air permits, the focus should be on the air quality at onshore locations, not air quality defined at offshore locations. This approach is consistent with the EPA's interpretation of Section 328 and the general purpose of the Clean Air Act, i.e., to protect public health and the environment. Further, it is consistent with the approach taken when assessing the effect of facilities onshore.

Under EPA regulations, "ambient air" is the "atmosphere, exterior to buildings to which the general public has access." (40.CFR.50.1(e)) Ambient air quality standards are developed to protect public health. And the impact of single facilities, for example, may be measured at the "fence line," the area where the general public has access.

To state the obvious, offshore drilling facilities have no fence line and the public can be many, many miles away from the vessel. But in the case of the Shell's OCS permit off the coast of Alaska, after much deliberation, EPA has currently decided that Shell must prove that the "public" - in this case people in boats – will effectively be excluded from some zone around the drill ship in order to establish the equivalent of a fence line that defines where ambient air starts. Without proof of such an exclusion zone, emissions measurements for Shell's rig must be made at the rail of the ship – many miles out at sea.

We believe that this is not in line with the purpose of the Clean Air Act or the intent of Section 328. Indeed, when EPA proposed its OCS regulations, it stated that "the intent of Congress in addition section 328 was to protect ambient air quality standards onshore and ensure compliance with the PSD requirements. EPA is to accomplish this **by controlling emissions of pollutants from the OCS that can be transported onshore and affect ambient air quality.**" EPA also indicated that Section 328 was to create a "more equitable regulatory environment" between onshore sources and OCS sources within 25 miles of land. EPA's approach to the Shell permit accomplishes neither of these objectives.

Second, Congress should clarify when a drilling vessel becomes a "source" to be regulated under the Clean Air Act. We agree with the definition provided in the discussion draft. A bright-line, common sense definition is when a floating exploration rig begins drilling.

In addition, consistent with Section 328, Congress should more precisely define an "OCS source" to clarify that only the drill rig is to be regulated. We understand and agree that the emissions of vessels associated with and operating near the drilling rig are considered when analyzing the impact of the drill rig on air quality. However, relevant control measures under PSD should only apply to the drilling rig. EPA otherwise regulates marine diesel engines under Title II of the Clean Air Act as mobile sources.

Third, Congress should address the uncertainties created in the OCS air permitting process, which undermine the offshore program that is so important to our nation's energy security. Specifically, we support a provision that would require EPA to take final agency action on an OCS air permit within six months of receiving a complete application, which would centralize judicial review of final permits in the D.C. Circuit Court of Appeals. As I have outlined in this statement, substantial delays have occurred even after an OCS permit was approved by EPA's regional office. The multiple reviews and remands have prevented receipt of a permit that the Agency considers "final" and that Shell can rely on to commence operations. Congress should streamline this process without cutting off the ability of those who disagree with a final permit to challenge EPA's decisions in court.

Conclusion

In closing, I am gratified by the President's recent energy speech in which he recognized the daunting energy challenge facing the nation. Although some of our opinions differ, we agree that it will take all possible energy sources – including energy savings -- to meet demand.

Oil and gas will remain critical sources of energy for decades to come. Rather than viewing this as a liability or a negative, I urge you to consider the broad and sustained benefits of developing our own domestic resources. By tapping our resources here, we will create jobs, power the economy, put billions into dwindling government coffers, provide energy security, reduce imports and reduce our trade deficit. Keeping this economic value here at home, we can at the same time move forward with the investments in the next generation of technologies and energy solutions that will power the future.

Thank you for the opportunity to speak with you. I am happy to answer any questions.

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Mr. WHITFIELD. Thank you, Mr. Lawrence. Ms. Ahtuangaruak, you are recognized for 5 minutes.

STATEMENT OF ROSEMARY AHTUANGARUAK

Ms. AHTUANGARUAK. Chairman, Ranking Member Rush, members of the committee, thank you for the invitation to participate in today's hearing.

Mr. WHITFIELD. Would you move the microphone a little closer?

Ms. AHTUANGARUAK. My name is Rosemary Ahtuangaruak and I have lived on the coast of the Arctic Ocean for most of my life. I recently moved to Barrow, Alaska from Nuiqsut, Alaska. I have served as mayor on numerous councils and organizations related to tribal leadership and for a long time as a community health aide. I am testifying on behalf of Alaska Wilderness League.

I am here to tell you how oil and gas development affects those of us who live on the Arctic Slope. This bill you are considering, to allow the oil industry to sidestep regulations on pollution as set forth by the Clean Air Act, will have a devastating impact on my people, who have called the Arctic home for thousands of years. If you allow this bill to move forward, you are telling me and everyone who lives in the Arctic that we—proud Inupiats and Americans—are less important than a few foreign-owned oil companies like Shell Oil.

Shell's proposed 2010 activities in the Chukchi Sea—much of which would be exempt under this law—would have released as much pollution as 825,000 cars driving 12,000 miles in a year and next year they are looking to more than double their proposed activities. Emissions from the oceangoing vessels that Shell is proposing to use include major contributors to global climate change. It has been well documented that air pollution travels long distances, and Shell's 2009 application for drilling permits showed that operations in the Chukchi Sea could cause significant health impacts to the Arctic Slope communities. We are rightfully concerned about the ramifications of these emissions and the overall actions as proposed.

Currently, the oilfields across the North Slope emit twice the amount of nitrogen oxide as emitted in Washington, D.C. All onshore North Slope communities would be additionally impacted by Shell's offshore proposal, including my former home, Nuiqsut, just west of the Arctic National Wildlife Refuge. Nuiqsut is already surrounded by oil pipelines from the Alpine oil field less than 4 miles away and a yellow haze can be seen for miles and miles. During winter there are many natural gas flares. As a result, I spent many busy nights on call responding to community members' complaints about respiratory illnesses. Our people have markedly higher rates of pulmonary disease than the general U.S. population and may have genetic predispositions to disease that differ from other U.S. populations. Our people are substantially more vulnerable to morbidity and mortality from air pollution than are other Americans.

When I started my career as a health aide in 1986, there was only one asthmatic patient. Then oil and gas was still many miles away. When I took my first break in '97, there were 60 people who had to use respiratory medications. Industry got much closer to my home. For this village of more than 500 people, a 600 percent increase in respiratory patients should get some type of response. Yet our voices continue to be ignored. Watching the eyes of babies fighting to breathe tears into you. Families have to fly sick children out of the village to Barrow or Anchorage. Knowing that the family has to send a parent with the child, what does it take from the family and the community?

Our people depend on a lifestyle and diet that is radically different from other U.S. populations. I live a very traditional lifestyle—hunting, fishing, whaling, gathering, and teaching my family and community members the traditional and cultural activities as my elders taught me. The land, sea, and air provide for us through the long, dark winters. Because of this, the Inupiat culture is intricately tied to the Arctic Ocean and our exposure to pollution comes from both our time on the land and on the water. We spend much of our time on the water fishing, hunting, and otherwise feeding our families. Our hunters and fisherman are out on the ice in the winter all year long. In the springtime and summer, we are out hunting for seals and preparing for the whaling season. In the fall, we are fishing and whaling. When the water freezes, we are preparing the whale for storage and preparing for the feasting and sharing.

Our people have used the Arctic Ocean since time immemorial for our subsistence practices. We don't just stay on land. Yet, despite the direct effects on our communities, this bill would also limit how my people participate in the clean air process while explicitly preserving the industry's right to appeal these same decisions. The Federal Government has continually failed in their responsibility to conduct government-to-government consultation with my people. This bill would even more severely limit our voice in the process that directly affects our wellbeing.

The Arctic Ocean is our garden. For thousands of years, we have stood watch over this garden and the animals that live in it. I ask you now, please don't keep us from fulfilling our sacred duty to protect this place and pass it on to our future generations.

[The prepared statement of Ms. Ahtuangaruak follows:]

Testimony of Rosemary Ahtuangaruak

"Jobs and Energy Permitting Act of 2011," Legislative Hearing
Subcommittee on Energy and Power, Energy and Commerce
April 13, 2011

Rosemary is an Inupiat Native who will be testifying as a citizen of the Arctic communities affected by the proposed legislation, and on behalf of Alaska Wilderness League.

Rosemary currently lives in Barrow on the northern coast of Alaska and has lived on the coast of the Arctic Ocean for most of her life. She moved to Barrow from Nuiqsut, Alaska, an Inupiat community on the Arctic's Beaufort Sea where she served as mayor and lived for many years. In Nuiqsut, she also served as a council member, tribal council member, school advisory council member, subsistence advisory board member and a longtime community health aide. Throughout her career, Rosemary has served as a council member for the Inupiat Community of the Arctic Slope (ICAS), an Alaska Native regional tribal government that represents the interests of the Inupiat people of the Arctic Slope region and as a council member for the Alaska Inter-Tribal Council (AITC). She is also a founding member of the non-profit organization Resisting Environmental Destruction on Indigenous Lands (REDOIL).

Rosemary's testimony will cover the effects of oil and gas development on the people who live on the Arctic Slope. She will specifically talk about the devastating impacts that she has seen firsthand from the pollution that would be exempted from regulation under the Clean Air Act by the proposed legislation.

Testimony of Rosemary Ahtuangaruak
United States House of Representatives
Committee on Energy and Commerce
Subcommittee on Energy and Power
Hearing on H.R. _______

April 13, 2011

Members of the Committee, thank you for the invitation to participate in today's hearing. My name is Rosemary Ahtuangaruak and I have lived on the coast of the Arctic Ocean for most of my life. I recently moved to Barrow, Alaska from Nuiqsut, Alaska, an Inupiat community on the Arctic's Beaufort Sea coast. In Nuiqsut, I served as mayor, council member, tribal council member, school advisory council member, subsistence advisory board member and a longtime community health aide. I also have served as a council member for the Inupiat Community of the Arctic Slope, an Alaska Native regional tribal government that represents the interests of the Inupiat people of the Arctic Slope region and as a council member for the Alaska Inter-Tribal Council (AITC). I am a founding member of the non-profit organization Resisting Environmental Destruction on Indigenous Lands (REDOIL). I am testifying on behalf of Alaska Wilderness League.

I am here to tell you how oil and gas development affects those of us who live on the Arctic Slope. The bill you are considering, to allow the oil industry to sidestep regulations on pollution as set forth by the Clean Air Act, will have a devastating impact on my people, who have called the Arctic home for thousands of years. If you allow this bill to move forward, you are telling me and everyone who lives in the Arctic that we – proud Inupiats and Americans – are less important than a few foreign-owned oil companies like Shell Oil.

The Clean Air Act has saved more than 200,000 lives and prevented millions of asthma attacks, heart problems and other serious illnesses. Those deaths weren't prevented, those illnesses weren't averted and those kids weren't saved because the EPA went door to door to polluters and said "Pretty please won't you clean up." Lives are saved and health improved when we let the experts at the agency responsible for making sure our air and water are clean and safe set the standards and then hold polluters accountable.

I live a very traditional lifestyle -- hunting, fishing, whaling, gathering, and teaching my family and community members the traditional and cultural activities as my elders taught me. I am a mother and grandmother with one daughter, four sons, five granddaughters, and four grandsons. As I teach the future generations our traditional ways, I can only hope that they will continue to be Inupiat – and not just residents in an industrialized area destroyed by Shell's offshore oil drilling.

The village where I raised my family, Nuiqsut, is located west of the Arctic National Wildlife Refuge and the Prudhoe Bay oil fields, near the Beaufort Sea coast in the Colville River delta. Nuiqsut is currently surrounded by oil pipelines from the Alpine oil field less than four miles away. When the Alpine oil field was first proposed to be built next to our village, we were promised jobs and a small industrial footprint. Now the footprint has grown to over 570 acres. What's more, only a handful of villagers work in the oil fields, and the yellow haze can be seen for miles and miles. Currently, nitrogen oxide emissions from the oil fields are more than twice the total emitted in Washington, D.C. During winter there are many natural gas flares. As a result, I had spent many busy nights on call responding to community members' complaints about respiratory illnesses.

When I started my career as a health aide in 1986 there was only one asthmatic patient - when I quit in 1997 there were 60 people who had to use respiratory medications. For this village of more than 400 people, a 600 percent increase in respiratory patients should get some type of response. Yet our voices continue to be ignored.

Air pollution isn't the only problem. We have water quality changes, land use conflicts, oil spills, noise pollution, increased traffic and disturbance to fish and wildlife species. And the social fabric of the community is under stress. Truancy, vandalism, domestic violence, alcohol and drug abuse and suicide are all increasing.

These impacts from onshore development are a harbinger of what could come with proposed offshore drilling. Shell and other oil companies already hold leases that are next to several Arctic Slope communities such as Kaktovik. What's more, it's been well documented that air pollution travels long distances – and Shell's 2009 application for drilling permits showed that operations in the Arctic's Chukchi Sea could cause significant health impacts to Arctic Slope communities. The Inupiat culture is intricately tied to the Arctic Ocean. We spend much of our time on the water – fishing, hunting and otherwise feeding our families. Our people have used the Arctic Ocean since time immemorial for our subsistence practices. We don't stay on land.

The Inupiat people depend on the animals of the land and the sea to live and thrive. We eat various birds, including ptarmigan, ducks and geese; fish, including char, salmon, whitefish, dolly varden, grayling, pike, trout, and cisco; land mammals, including caribou, moose and muskox; and marine mammals, including bearded seals, walrus, beluga and bowhead whales. We harvest berries, plants roots and herbs. We work together in harvesting plants and animals. We have extensive sharing traditions that unite our families and communities. Other communities share their harvest with my family and we share our harvest with others. These sharing patterns have given us much of the variety of foods that we eat. We also share our harvest with those in need. The land, sea and air provide for us through the long, dark winters. We need them to survive, as the jobs around us often go to outsiders.

Our food sources have undergone great changes since oil development has surrounded us. Seismic vibrators looking for oil and frequent helicopter flights have disturbed the caribou herds where I live. The migration used to come right into to town but the caribou do not come through Nuiqsut anymore, and most of our hunters have found it takes many trips to harvest caribou. What's more, more of our people are seeing changes to our animals showing signs of illness. I travelled to all the North Slope villages last year before touring the spill and many shared concerns from the lemmings in Pt. Lay to the seals in Barrow, Wainwright and Pt. Hope. All villages expressed concern to traditional and cultural activities changed by the activities for oil and gas exploration and then development.

Fish have been decreasing in numbers, and multiple species are being affected. Fish caught in our nets have been deformed and yellow or have been found with increased parasites or tumors in the muscle or reproductive glands. Some are skinny and taste bitter.

More than anything else, Inupiat communities across the Arctic coast of Alaska depend on bowhead whales for subsistence food. Our culture is tied intimately with the whales and the sea. Nuiqsut whalers hunt for bowhead whales in the Beaufort Sea during the fall. We await the migration of the whales from Camden Bay for this hunt. The crews go to Cross Island in August. Our family helps with the preparations and receives a share of the harvest.

Shell's proposals to drill for oil and gas in the Chukchi and Beaufort Sea could cause great harm to the bowhead whales. Shell's exploration drilling, icebreaking, aircraft and helicopter flights, and other noisy activities in the Beaufort and Chukchi Seas will keep whales from their feeding areas or otherwise harm them.

We educate our families that a whale hunt must be respectful and quiet. If the noise from Shell's drilling and icebreaking causes whales to be farther offshore, I am concerned that this would and put our whalers at greater risk. We have been taught not to put things in the water that may cause the whales to turn away from the hunting grounds. I fear that water discharges from drillships or the presence of drilling muds in the water where Shell conducts its activities will cause whales to avoid our hunting grounds.

If the whale hunts are less successful, I fear that the community will suffer, as it has in the past during times of shortage. To give an example, in the early 1990s there were seismic activities and exploration drilling in Camden Bay that severely affected our whaling. The following winter, there was an unusually high rate of domestic violence in Nuiqsut and increases in suicide attempts and in suicides. We also experienced increases in drug and alcohol use as well. As a community health aide, I listened to people's stories of how difficult it was to hunt without success. That winter was the worst I spent as a community health aide.

Our way of life could be destroyed in an instant if Shell were to drill and cause a large oil spill. Last year, I traveled to the Gulf of Mexico to learn more about the communities, animals and ecosystems impacted by that tragic oil spill. I returned, having witnessed the trauma of the people who felt the devastation to that area. That trip is a strong burden that I'll carry with me for the rest of my life. It brought tears to my eyes – fumes of the spill were permeating the air. It got into our clothes into our nose into our hair. As we traveled out into the water it only got worse. The people living down there had no escape – the natural smell of the ocean was nonexistent.

The Arctic's extreme conditions and isolation make it nearly impossible to clean up an oil spill. All this is widely known, yet the federal government is still allowing the oil industry to push forward with aggressive drilling plans as if disasters like last year's Gulf of Mexico spill or the Exxon Valdez spill 22 years ago in Prince William Sound never happened. If it is allowed to happen in the Arctic, my home, my culture, my people will be destroyed forever.

The Arctic Ocean is our garden. For thousands of years, we have stood watch over this garden and the animals that live in it. I ask you now, please don't keep us from fulfilling our sacred duty to protect this place and pass it on to our future generations.

Alaska Eskimo Whaling Commission
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Barrow, AK 99723

Inupiat Community of the Arctic Slope
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Barrow, AK 99723

North Slope Borough
P.O. Box 69
Barrow, AK 99723

March 22, 2010

Via Electronic Mail

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Re: Comment Letter Regarding Shell Gulf of Mexico/Shell Offshore Inc.'s OCS Pre-Construction Air Permit Application for the Beaufort Sea Exploration Program, the Draft Permit, and EPA's Statement of Basis for the Draft Permit.

Dear Ms. Helm and Ms. Greaves:

Thank you for the opportunity to comment on Shell's Beaufort Sea Clean Air Act (CAA) proposed permit application, and the Environmental Protection Agency's (EPAs) proposed permit and statement of basis for that permit. Because of our continuing and unified interest in minimizing the impacts of air pollution and climate change in our Arctic communities and surrounding environment these comments are submitted jointly on behalf of the Alaska Eskimo Whaling Commission (AEWC), the Inupiat Community of the Arctic Slope (ICAS), and the North Slope Borough (NSB).

At the outset, we wish to express our sincere thanks to EPA for visiting the North Slope and discussing this proposed permit with representatives from our organizations. We acknowledge EPA's efforts to draft a comprehensive permit within a very limited time frame and recognize the immense pressure EPA has been under to finalize this permitting process. We are encouraged by your efforts and submit these comments to assist you in your review of Shell's proposed action. We hope that you will permit the proposed emissions only when their impact to the health and welfare of our people is minimized to the greatest extent possible.

As you know, AEWC is a non-profit organization representing Inupiat whaling captains in the eleven bowhead whale subsistence hunting villages of Barrow, Nuiqsut, Kaktovik, Pt. Hope, Kivalina, Wales, Savoonga, Gambell, Little Diomede, Wainwright, and Pt. Lay. Our whaling captains and their communities rely upon the health of Camden Bay and its surrounding waters

to provide for marine life, which in turn sustain our people and our culture. AEWC is responsible for safeguarding the hunt of the bowhead whale and the subsistence way of life that Arctic waters support. AEWC's Inupiat and Siberian Yupik whaling captains have thousands of years of traditional knowledge about the Arctic ecosystem, and AEWC is also well versed in the current science regarding the health and status of the natural resources of the Arctic.

ICAS is a regional tribal government for eight villages on the North Slope that depend upon the marine mammals living in and migrating through Arctic waters. The Beaufort Sea is a unique and diverse marine environment with great cultural significance for the Inupiat people who hunt and fish in this area. We have previously experienced oil and gas activities in the Arctic that caused direct conflicts with subsistence activities and the resources that have sustained the Inupiat for thousands of years. Because offshore oil and gas activities pose risks to Inupiat subsistence activities and cultural preservation, they require careful review.

The NSB has the largest territorial and coastal jurisdiction of any municipal government in the United States, an area that is larger than the State of Minnesota. The NSB has multiple interests at stake in Shell's proposed Camden Bay Exploration Plan underlying this CAA permit. First and foremost are the NSB's interests related to the health and welfare of our residents, who are rightfully concerned about potential health impacts associated with oil and gas development on the North Slope. These impacts may be direct, indirect or cumulative in nature and relate to the contamination and degradation of the natural environment upon which our residents rely.

Our communities that will be impacted by Shell's proposal include those that are onshore from Shell's proposed operations, in particular Nuiqsut and Kaktovik, and also those that rely upon the resources from the Beaufort Sea. Shell's proposed air emissions pose risks to all these communities. Emissions from the ocean-going vessels that Shell is proposing to use include major contributors to global climate change, such as carbon dioxide (CO_2), and pollutants harmful to human health, such as nitrogen oxides (NOx), sulfur oxides (SOx), and particulate matter (PM).[1] EPA has recognized that

> in 2001 marine diesel engines with per-cylinder displacement of 30 liters or more (a group roughly corresponding to the engines covered by the new IMO [International Maritime Organization] standards) contributed 6% of the NOx coming from all mobile sources in the U.S., as well as 10% of the PM, and 40% of the SOx. We further estimate that without new emission controls,

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[1] The International Council on Clean Transportation, Air Pollution and Greenhouse Gas Emissions from Ocean-going Ships: Impacts, Mitigation Options and Opportunities for Managing Growth (2007) (available at: http://www.theicct.org/documents/MarineES_ Final_Web.pdf).

> these contributions would have increased by 2030 to 34% of the NOx coming from all mobile sources in the U.S., 45% of the PM, and 94% of the SOx.[2]

We are rightfully concerned about the ramifications of these emissions and the overall action as proposed, given the significance of its potential and disproportionate impacts on our people.

The people who will be affected by Shell's air emissions live in isolated areas, depend on a lifestyle and diet that is radically different from other U.S. populations, have markedly higher rates of pulmonary disease than the general U.S. population, and may have genetic predispositions to disease that differ from other U.S. populations. As abundant public health data has demonstrated, our people are substantially more vulnerable to morbidity and mortality from air pollution than are other Americans. A human health impact assessment, more thorough ambient air modeling and baseline emission assessments are needed to assure that human health is protected.

We commend Shell for recognizing the need and providing for the use of ultra low sulfur fuel to reduce emission in all of the 2010 exploration fleet. But, as demonstrated in the attached comments, the proposed emissions are still significant. We have identified a number of areas where the proposed permit needs revision to conform to CAA and its regulations. These areas include:

1. The need for EPA to regulate the CO_2 emissions from Shell's proposed operations;

2. The need for Shell to comply with the new NAAQS for NO_2;

3. The need for Shell to comply with the new PSD increments for $PM_{2.5}$;

4. The need for the Final Permits to only encompass those activities for which Shell is currently seeking authorization for under OCSLA;

5. The need to apply BACT and the corresponding on shore regulations to all the vessels and engines associated with Shell's proposed activities at the drill site;

6. The need to more thoroughly apply BACT to those vessels and engines that are currently being regulated; and

7. The need to comply with several other environmental laws before a permit is issued to Shell.

Until these areas of concern are resolved, we ask that a permit not be issued for the proposed offshore oil and gas exploration emissions. There are demonstrated and required means to considerably reduce the air emissions associated with this action. These means should be implemented to assure compliance with federal law, and most importantly, to avoid unnecessary impacts to the health and welfare of our people.

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[2] EPA, Program Announcement: International Maritime Organization Adopts Program to Control Air Emissions from Oceangoing Vessels (2008) (available at: http://www.epa.gov/oms/regs/nonroad/marine/ci/420f08033.pdf).

Thank you again for the opportunity to comment. Please feel free to contact us if you have questions regarding these comments.

Sincerely,

NOLI' MCINTYRA
FINANCE OFCR.
for
Harry Brower
Chairman
AK. Eskimo Whaling Commission

DOREEN LAMPE
VICE PRESIDENT, ICAS
for
George Edwardson
President
ICAS

Edward S. Itta
Mayor
North Slope Borough

cc: sent viafirst class or electronic mail

Senator Lisa Murkowski
Senator Mark Begich
Representative Don Young
Richard Albright, EPA, Region 10
Pat Nair, EPA, Region 10
Jeffrey Walker, Minerals Management Service
Andy Mack, NSB Mayor's Office
Karla Kolash, NSB Mayor's Office
Bessie O'Rourke, NSB Attorney
Taqulik Hepa, NSB Director, Wildlife Management
Dan Forster, NSB Director, Planning

AEWC, ICAS, AND NORTH SLOPE BOROUGH'S COMMENTS REGARDING SHELL GULF OF MEXICO AND SHELL OFFSHORE INC.'S APPLICATION FOR AN OCS PSD PERMIT UNDER THE CLEAN AIR ACT.

These unified comments are submitted jointly on behalf of the Alaska Eskimo Whaling Commission (AEWC), the Inupiat Community of the Arctic Slope (ICAS), and the North Slope Borough (NSB), who hereafter will collectively be referred to as "NSB."

STATUTORY AND FACTUAL BACKGROUND.

Statutory Background.

The prevention of significant deterioration (PSD) program was added to the Clean Air Act (CAA) in 1977. The PSD program helps ensure that national ambient air quality standards (NAAQS) are attained. It requires new major stationary sources to obtain preconstruction permits in areas where the NAAQS have been attained (attainment areas).[1] In 1990, Congress decided to regulate air pollution in the Outer Continental Shelf (OCS) by amending the CAA to include the OCS program which regulates offshore entities by requiring them "to attain and maintain Federal and State ambient air quality standards and to comply with the" PSD program.[2] EPA has promulgated regulations to control air pollution on the outer continental shelf (OCS) for this purpose.[3]

Under the PSD program, if an OCS source is located 25 miles beyond a state's seaward boundary that source is "subject to the New Source Performance Standards (NSPS), in 40 C.F.R Part 60."[4] If the OCS source qualifies as "a major stationary source," then the standards promulgated under Section 112 of the CAA (the National Emissions Standards for Hazardous Air Pollutants or NESHAPs) apply to the source.[5] The potential for the OCS source to emit New Source Review (NSR) pollutants[6] must be calculated and the OCS source must apply for a CAA Title V operating permit.[7]

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[1] 42 U.S.C. § 7475.

[2] 42 U.S.C. § 7627(a)(1).

[3] *See* 40 C.F.R. part 55.

[4] EPA, Region 10, Statement of Basis for Proposed Outer Continental Shelf Prevention of Deterioration Permit No. R10OCS/PSD-AK-2010-01 Shell Gulf of Mexico Inc. Frontier Discoverer Drillship Beaufort Sea Exploration Drilling Program at 18 (Feb. 17, 2010) (hereafter "EPA Stmt of Basis"); *see also* 42 U.S.C. § 7627(a)(1) (EPA "shall establish requirements to control air pollution from Outer Continental Shelf sources located offshore of the States . . . to attain and maintain Federal and State ambient air quality standards and to comply with the provisions of part C of subchapter I of this chapter").

[5] *Id.* (internal citations omitted).

[6] Here the relevant NSR pollutants are CO, NOx, PM, $PM_{2.5}$, PM_{10}, SO_2, VOC, and CO_2.

[7] *See* 40 C.F.R. § 71.5(a)(1)(i).

If an OCS source is located within 25 miles of a state's seaward boundary, the same requirements for sources located in the "corresponding onshore area" (COA) apply.[8] As the COA requirements are subject to change, EPA is required to update the OCS regulations as necessary to remain consistent with the applicable COA requirements.[9] EPA most recently updated the OCS regulations on January 21, 2010 to reflect the current COA requirements in Alaska.[10]

The "PSD program includes a requirement" that the permit applicant evaluate "the effect that the proposed emissions are expected to have on air quality related values such as visibility, soils, and vegetation."[11] Before issuing a PSD permit to a major new stationary source, EPA must conduct a Best Available Control Technology (BACT) analysis for each pollutant that the source has the potential to emit in significant quantities.[12]

Factual Background.

Compared to many areas in the United States, the communities along the North Slope of Alaska have fewer combustion sources. While these communities are recipients of air pollution from other areas, they are still relatively pristine. Shell has proposed a large oil and gas exploration undertaking involving a drill ship, a fleet of support vessels including two ice breakers and aircraft traveling to and across the Arctic Ocean from July through October. Among the other known impacts associated with this action, the exploration activities will emit tons of health harming and climate changing pollutants into the air.

Prior oil and gas operations have impacted air quality on the North Slope. As EPA has noted, "[o]zone levels" and the levels of "ozone precursors (i.e., NO_x and VOC)" in areas where "oil and gas operations are currently located" are "higher than the levels that have been collected at the Wainwright monitoring site."[13] Thus, demonstrating the impacts such operations can have.

Shell is proposing "to operate the Discoverer drillship and associated fleet in the Beaufort Sea" and seeks "a major source permit to authorize mobilization and operation of the [] Discoverer [] and its Associated Fleet at" one or more of Shell's leases that it obtained during Lease Sale 195 and 202.[14] Shell is proposing a "maximum of 168 drilling days

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[8] EPA Stmt of Basis at 18, citing 42 U.S.C. § 7627(a)(1).

[9] *Id.*

[10] EPA Stmt of Basis at 18, citing 75 Fed. Reg. 3392.

[11] EPA Stmt of Basis at 20.

[12] 42 U.S.C. § 7475(a)(4).

[13] EPA, Region 10, Statement of Basis for Proposed Outer Continental Shelf Prevention of Deterioration Permit No. R10OCS/PSD-AK-09-01 Shell Gulf of Mexico Inc. Frontier Discoverer Drillship Chukchi Sea Exploration Drilling Program at 76 (Aug. 14 2009).

[14] EPA, Region 10, Statement of Basis for proposed Outer Continental Shelf Prevention of Deterioriation Permit No. R10OCS/PSD-AK-09-01, Shell Gulf of Mexico Inc. Frontier Discoverer Drillship Chukchi Sea Exploration Drilling Program at 10 (January 8, 2010) (hereafter "EPA Re-Proposed Stmt of Basis").

(5.5 months), beginning in July of each year" and "[d]rilling is planned to begin no earlier than July of 2010 and continue seasonally (i.e. July to December each year) until the resources under Shell's current leases are adequately defined."[15]

Shell has proposed to drill two wells in the vicinity of Camden Bay in the Beaufort Sea and --during the same timeframe--up to three wells in the Chukchi Sea. Shell owns many more leases in nearby areas, where future exploratory drilling will likely occur. Thus, the overall, cumulative impacts of Shell's proposed and likely future operations on the air quality of the North Slope must be accounted for.

I. EPA Needs To Address Carbon Dioxide And Other Greenhouse Gas Emissions In The Draft Permit.

Before issuing a PSD permit, the Clean Air Act requires that the EPA conduct a BACT analysis and include emissions limitations for "each pollutant subject to regulation" under the Act.[16] Carbon dioxide (CO_2) and the other greenhouse gases (GHGs) that will be emitted in significant quantities through Shell's Beaufort Sea exploratory drilling program are pollutants under CAA,[17] and therefore need to be included in a BACT analysis.

The proposed permit for Shell's Beaufort Sea exploratory drilling program does not address carbon dioxide (CO_2) or other greenhouse gases (GHGs) to be emitted from the proposed OCS sources.

A. The Proposed Permit Would Result in Emission od Significant Amounts of CO_2 and Other Greenhouse Gases

Greenhouse gas emissions from oil and gas sources can be significant. The Arctic has already witnessed temperature increases that are twice as large as global averages and is poised to continue warming temperatures at greater levels than the rest of the world.[18] The effects of global warming are acute in the Arctic where melting sea ice,[19] ocean pH levels are changing,[20] and increased flooding and erosion[21] threaten local species and coastal communities. In the Exploration Plan for the Chukchi exploration, Shell noted that the US Fish and Wildlife Service has recognized that climate change threatens the survival of marine mammals who depend upon sea ice.[22] Reducing greenhouse gas emissions is imperative to slowing and stopping these dramatic events from further harming the people and ecosystem of the Arctic.[23]

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[15] *Id.* at 14.

[16] 42 U.S.C. § 7475(a)(4).

[17] *Massachusetts v. EPA*, 549 U.S. 497 (2007).

[18] *See* International Panel on Climate Change, Climate Change: 2007 Synthesis Report, at 30 (available at: http://www1.ipcc.ch/ipccreports/assessments-reports.htm) (Attachment 1); Allen J. Parkinson et al., *Potential Impact of Climate Change on Infectious Disease in the Arctic*, 64 INT'L J. CIRCUMPOLAR HEALTH 478, 479 (2005).

[19] *See* Elizabeth Bluemink, *Sea ice melt 3rd largest in 30 years*, ANCHORAGE DAILY NEWS (Sep. 17, 2009) *available at* http://www.adn.com/2009/09/17/939372/sea-ice-melt-3rd-largest-in-30.html); *see also Arctic Marine Shipping Assessment 2009 Report*, Arctic Council p. 26 *available at* http://web.arcticportal.org/en/pame/amsa-2009-report (reporting that the five smallest September ice-covered areas for the Arctic Ocean during the modern satellite record (1979-2008) have occurred in the five most recent seasons (2004-2008)).

The Discoverer drillship would add an estimated 20,000 tons of CO_2 emissions to the air each year and about 60,000 tons per year from the Discoverer and its support vessels.[24] The fleet's total annual CO_2 emissions would be akin to the annual CO_2 emissions from 11,000 cars.[25]

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[20] *See* Dan Joling, *Acidity in Alaska ocean waters puts fisheries at risk*, ANCHORAGE DAILY NEWS (Aug. 24, 2009) *available at* http://www.adn.com/2009/08/24/909455/acidity-in-alaska-ocean-waters.html; Carin Stephens, *New findings show increased ocean acidification in Alaska waters*, UAF Newsroom (Aug. 12, 2009) *available at* http://www.uaf.edulnewslheadlines/20090811160143.html.

[21] *See* Rachel D'Oro, *Eroding village appeals suit dismissal*, ALASKA DAILY NEWS (Jan. 29, 2010) *available at* http://www.adn.com/2010/01/28/1115618/eroding-village-appeals-suit-dismissal.html; Henry Huntington and Shari Fox, *The Changing Arctic: Indigenous Perspectives* p. 76, Chapter 3 *in Impact of a Warming Arctic: Arctic Climate Impact Assessment* (2004) *available at* http://www.acia.uaf.edu/pages/scientific.html; *Alaska Native Villages, Most Are Affected by Flooding and Erosion, but Few Qualify for Federal Assistance*, U.S. General Accounting Office Report to Congressional Committees, No. GAO-04-142 (2003) p. 3 *available at* http://gao.gov/new.items/d04142.pdf; *Draft Final Climate Change and Health Impacts Point Hope*, Alaska Center for Climate and Health Alaska Native Tribal Health Consortium (2009) at 22 *available at* http://www.anthc.org/chs/ces/climate/upload/Point-Hope-CCHIA-Draft-Final.pdf).

[22] Shell, Environmental Impact Assessment, Camden Bay Exploration Plan at 136, 138 (May 2009) ("Shell's Camden Bay EIA").

[23] Shell states that the proposed CO_2 emissions represent an "extremely small amount" of global greenhouse gases and thus the cumulative effects are insubstantial. Shell Camden Bay EIA at 203. However, this position ignores the importance of incremental regulatory steps toward redressing harms caused by global warming. In *Massachusetts v. EPA*, the Supreme Court rejected the argument that mobile source emissions were such an insignificant amount of global greenhouse gases that regulation of those emissions could not redress the petitioners' injury from global warming because of the importance of incremental steps. 549 U.S. at 524-525.

[24] OCS EIS/EA MMS 2009-052 Environmental Assessment, Shell Offshore Inc., 2010 Outer Continental Shelf Lease Exploration Plan, Camden Bay, Alaska, Beaufort Sea Leases OCS-Y-1805 and 1941, p. 65. Available online at http://www.mms.gov/alaska/ref/EIS%20EA/mms2009_052_ea/2009_1015_EA .

[25] Based on fuel economy numbers from EPA MOBILE6.2 (EPA's computer model for estimating emissions for highway vehicles), an average passenger vehicle emits approximately 5 metric tons of CO_2 equivalent per year. "Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle", EPA420-F-05-004 February 2005 (available at: http://www. epa.gov/otaq/climate/420f05004.htm) (Attachment 2).

The significant cumulative impacts of marine diesel engines (including those employed by Shell) on air quality are now international recognized.[26] In 2008, the 168 Member States of the International Maritime Organization (IMO) adopted stringent new standards to control harmful exhaust emissions from these engines.[27] In 2009, EPA adopted these standards.[28]

Methane (CH_4) emissions will result from vented sources during Shell's exploration drilling program. Methane is of particular concern as a greenhouse gas since it is over 20 times more effective at trapping heat in the atmosphere than carbon dioxide over the same 100-year period.[29] In fact, the CO_2 and CH_4 emissions from Shell's exploratory operations are hardly insignificant when considering the grave impacts to the Arctic Region from changes to the climate.

Recent research on the effects of black carbon on climate change indicate that the pollutant -- a product of fossil fuel combustion -- may have significant impacts on climate change, especially in the Arctic region.[30] A portion of the $PM_{2.5}$ emissions from both the Beaufort Sea and Chukchi Sea exploration activities are made up of black carbon emissions (from diesel fuel combustion). According to EPA, there is sufficient evidence to support the reduction of black carbon emissions as a means to slow the rate of warming in the Arctic over the next few decades.[31]

EPA must regulate these significant CO_2 emissions from Shell's operations. In Alaska, the oil and gas industry emits 15 million tons of CO_2 emissions each year.[32] By conducting CO_2 and GHG BACT analyses for Alaskan oil and gas sources that emit PSD thresholds of CO_2 and other GHGs, the agency could reduce a significant amount of these pollutants that are emitted.

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[26] EPA, Program Announcement: International Maritime Organization Adopts Program to Control Air Emissions from Oceangoing Vessels (2008) (available at: http://www.epa.gov/nonroad/marine/ci/420f08033.htm) (Attachment 3).

[27] *Id.*

[28] EPA, Program Announcement: EPA Finalizes More Stringent Standards for Control of Emissions from New Marine Compression-Ignition Engines at or Above 30 Liters per Cylinder: Regulatory Announcement (2009) (available at: http://www.epa.gov/nonroad/marine/ci/420f09068.htm)

[29] EPA Methane Information (available at: http://www.epa.gov/methane/index.html) (Attachment 4) ("Methane is of particular concern as a greenhouse gas since it is over 20 times more effective at trapping heat in the atmosphere than carbon dioxide over the same 100-year period.").

[30] *See*, e.g., *Arctic Marine Shipping Assessment 2009 Report,* Arctic Council at 5 (available at: http://web.arcticportal.org/en/pame/amsa-2009-report).

[31] M. Sarofim et al. Current Policies, Emission Trends and Mitigation Options for Black Carbon in the Arctic Region, Draft White Paper, U.S. EPA and others, April 28, 2009, available at http://iiasa.ac.at/rains/reports/DRAFTWhitePaper-BCArcticMitigation-280909.pdf

[32] Shell Camden Bay EIA at 65.

B. Greenhouse Gases are Pollutants Subject to Regulation Under the CAA and Therefore Must be Included in Shell's Permit.

As EPA has recently recognized, CO_2 and other greenhouse gases clearly fall within the Clean Air Act's definition of "air pollutant." The CAA defines "air pollutant" to include "*any* physical, chemical, biological, radioactive . . . substance or matter which is emitted into or otherwise enters the ambient air."[33] Further, the CAA specifically includes carbon dioxide in a list of "air pollutants." Section 103(g) of the CAA directs EPA to conduct a research program concerning "[i]mprovements in nonregulatory strategies and technologies for preventing or reducing multiple air pollutants, including . . . ***carbon dioxide***, from stationary sources, including fossil fuel power plants."[34]

EPA is required to regulate emissions of air pollutants, including carbon dioxide, under a number of the Clean Air Act's major substantive provisions, when, in EPA's judgment, such emissions cause or contribute to air pollution which "may reasonably be anticipated to endanger public health or welfare."[35] Examples include: section 111 establishing new source performance standards for categories of stationary sources; and section 202 establishing standards for emissions from new motor vehicles. EPA requires that major sources monitor, record, and report emissions of CO_2 pursuant to section 821 of the CAA.[36] Further, the Act's definition of "welfare," specifically includes effects on "climate" and "weather."[37] Section 165(a)(2) of the CAA provides that a major emitting facility is "subject to the best available control technology for each pollutant subject to regulation under [the Clean Air Act] emitted from, or which results from, such facility."[38]

Section 165(a)(2) of the CAA provides that a major emitting facility is "subject to the best available control technology for each pollutant subject to regulation under [the Clean Air Act] emitted from, or which results from, such facility."[39] EPA has taken several actions that indicate carbon dioxide and other greenhouse gases are subject to regulation under the Act, i.e., promulgating monitoring and reporting requirements and approving a state implementation plan that regulates carbon dioxide.[40]

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[33] 42 U.S.C. § 7602(g) (emphasis added).

[34] 42 U.S.C. § 7403(g)(1) (emphasis added).

[35] 42 U. S. C. § 7521(a)(1).

[36] *See*, 40 C.F.R. § 75. Section 821 of Pub.L. 101-549 stated that: "(a) Monitoring.--The Administrator of the Environmental Protection Agency shall promulgate regulations within 18 months after the enactment of the Clean Air Act Amendments of 1990 to require that all affected sources subject to Title V of the Clean Air Act shall also monitor carbon dioxide emissions according to the same timetable as in section 511(b) and (c).

[37] 42 U.S.C. § 7602(h).

[38] 42 U.S.C. § 7475(a)(2).

[39] 42 U.S.C. § 7475(a)(2).

[40] *See* Prevention of Significant Deterioration (PSD): Reconsideration of Interpretation of Regulations That Determine Pollutants Covered by the Federal PSD Permit Program, 74 Fed. Reg. 51535, 51538 (to be

EPA has recognized the need for regulation of greenhouse gas emissions announcing on September 30, 2009 a proposal requiring large industrial facilities that emit at least 25,000 tons of greenhouse gases a year to obtain construction and operating permits covering these emissions.[41] These permits must demonstrate the use of best available control technologies and energy efficiency measures to minimize greenhouse gas emissions. EPA has also finalized a rule to require mandatory reporting of greenhouse gas emissions, such as carbon dioxide, from "large sources" in the United States.[42] Under the rule, EPA proposes to require facilities that emit 25,000 metric tons or more per year of greenhouse gas emissions to submit annual reports to EPA. These reporting standards should apply to the current proposal because Shell is proposing to emit a total of almost 60,000 tons of CO_2 per year.[43]

Recently, the Environmental Appeals Board (EAB) remanded two PSD permits where the permitting agencies failed to articulate a rationale basis for not conducting a BACT analysis for CO_2.[44] In both *Deseret* and *Northern Michigan*, the EAB determined that the permitting authorities had not provided sufficient information in the administrative record as to why a BACT analysis was not required for CO_2. In doing so, the EAB rejected the permitting authorities' arguments as to why CO_2 is not subject to regulation.

In *Deseret*, EPA Region 8 argued it was constrained by the historical agency interpretation that "subject to regulation" meant a pollutant had an actual emission limitation or control, which were not present in section 821's monitoring and reporting requirements. Region 8 also argued that section 821 is not actually part of the CAA because it was not written into the U.S. Code.[45] The EAB flatly rejected Region 8's argument, stating it was at odds with the agency's prior stance on section 821. In doing so, the EAB suggested that CO_2 is subject to regulation under section 821:

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codified at 40 C.F.R. pt. 52) (October 7, 2009) (discussing petitioners' arguments for why carbon dioxide is subject to regulation)

[41] *See* Fact Sheet -- Proposed Rule: Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule (available at: http://www.epa.gov/NSR/fs20090930action.html) (Attachment 5).

[42] *See* Background information on the Proposed Mandatory GHG Reporting Rule (available at: http://www.epa.gov/climatechange/emissions/ghgrulemaking.html) (Attachment 6).

[43] OCS EIS/EA MMS 2009-052 Environmental Assessment, Shell Offshore Inc., 2010 Outer Continental Shelf Lease Exploration Plan, Camden Bay, Alaska, Beaufort Sea Leases OCS-Y-1805 and 1941, p. 65. Available online at http://www.mms.gov/alaska/ref/EIS%20EA/mms2009_052_ea/2009_1015_EA.

[44] *See In re: Deseret Power Electric Cooperative*, PSD Appeal No. 07-03, 14 E.A.D. --- (Nov. 13, 2008); *In re: Northern Michigan University Ripley Heating Plant*, PSD Appeal No. 08-02, 14 E.A.D. --- (Feb. 18, 2009).

[45] EPA is reconsidering its interpretation of this provision, *see* PSD: Reconsideration of Interpretation of Regulations That Determine Pollutants Covered by the Federal PSD Permit Program, 74 Fed. Reg. 51535-51549 (Oct. 7, 2009).

> the preamble as a whole augers in favor of a finding that the Agency expressly interpreted 'subject to regulation under this Act' to mean 'any pollutant regulated in Subchapter C of Title 40 of the Code of Federal Regulations for any source type.'[46]

The permitting agencies in *Deseret* and *Northern Michigan* could not provide an adequate explanation why CO_2 is not subject to regulation because there simply is not one. Between section 821 of the CAA and Delaware's emissions limitations on electrical generators, CO_2 is definitively regulated under the CAA and must be subject to a case-by-case BACT analysis for new sources that will emit the pollutant in significant amounts. In the absence of a BACT analysis for Shell's operations, the EPA must provide a legally defensible justification as to why CO_2 is not subject to regulation under the Act.

C. Shell's Permit Must Require BACT for the CO_2 Emissions To Remain in Line with EPA's Proposed Regulatory Changes.

On December 15, 2009, EPA formally announced that greenhouse gases "endanger both the public health and the public welfare of current and future generations."[47] Although EPA's endangerment findings were promulgated under Clean Air Act section 202(a), which deals with transportation sources, the agency's findings were clear: human activities are increasing the concentrations of greenhouse gases in our atmosphere and are contributing to global climate change, which "may reasonably be anticipated both to endanger public health and to endanger public welfare."[48] In reaching this conclusion, the agency relied upon evidence that demonstrated greenhouse gases pose a risk to food production and agriculture, forestry, water resources, sea level rise and coastal areas, energy infrastructure, settlements, and ecosystems and wildlife.

As a result of this finding, EPA will be issuing regulations that control CO_2 emissions. It is likely that EPA will finalize the light-duty vehicle rule by the end of March 2010.[49] Once this rule is finalized, there will be no argument that greenhouse gases are not subject to regulation under the Clean Air Act, and the PSD permitting requirements will be triggered.[50] At that point, which will almost certainly be before EPA finalizes Shell's permit, Shell's operations will be subject to BACT for greenhouse gases.

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[46] *In re: Deseret Power Electric Cooperative,* PSD Appeal No. 07-03, Slip Op. at 3.

[47] 74 Fed. Reg. 66496 (2009) (to be codified at 40 C.F.R. ch. I) (Dec. 15, 2009) *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act*, 74 Fed. Reg. 66497 (Dec. 15, 2009) ("Pursuant to CAA section 202(a), the Administrator finds that greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare. Specifically, the Administrator is defining the 'air pollution' referred to in CAA section 202(a) to be the mix of six long-lived and directly-emitted greenhouse gases . . .").

[48] *Id.* at 66497.

[49] Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 74 Fed. Reg. 55292, 55300 (to be codified at 40 C.F.R. pt. 51, 52, 70, and 71) (Oct. 27, 2009) ("as soon as GHGs become regulated under the light-duty motor vehicle rule, GHG emissions will be considered pollutants "subject to regulation" under the CAA and will become subject to PSD and title V requirements.")

EPA has recognized that the promulgation of the light-duty vehicle rule will require PSD facilities to regulate GHGs, so the agency has developed temporary applicability thresholds at 25,000 tons per year.[51] Because Shell's operations will emit greenhouse gases in excess of the proposed tailoring threshold,[52] we request that the permit include BACT for these greenhouse gases. This step is necessary to protect the marine life and habitat that has supported North Slope communities since time immemorial.

This would not be the first permit to include a BACT analysis for CO_2. A combined petroleum refinery and IGCC power plant completed a CO_2 BACT analysis for its permit.[53] This analysis was performed *almost a year ago* in light of the rapid changes in the political, regulatory and legal framework. Certainly at this point in time, when CO_2 regulations are eminent, at the very least Shell needed to undertake a BACT analysis and delineate technologies that could be used to control its CO_2 emissions in the very likely event such measures are required.

By conducting CO_2 and GHG BACT analyses for Alaskan oil and gas sources that emit PSD thresholds of CO_2 and other GHGs, EPA could reduce a significant amount of pollution. In doing so, the EPA would take an important step toward slowing the acute effects of global warming in the Arctic.

II. Compliance With The New NAAQS For Nitrogen Dioxide Is Also Necessary.

On February 9, 2010 EPA issued a final rule to strengthen its national ambient air quality standard for nitrogen dioxide.[54] With this action EPA established a new 1-hour standard at a level of 100 parts per billion (ppb) to supplement the existing annual standard of 100 $\mu g/m^3$. According to EPA's fact sheet on this regulatory action:

> [t]his level defines the maximum allowable concentration anywhere in an area. It will protect against adverse health effects associated with short-

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[50] *Id.* at 51545.

[51] Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 74 Fed. Reg. 55292, 55305 (to be codified at 40 C.F.R. pt. 51, 52, 70, and 71) (Oct. 27, 2009 ("The first phase entails the establishment of applicability thresholds at the 25,000 tpy CO2e levels, and significance levels at between 10,000 and 25,000 tpy CO2e.")

[52] *See* Shell Camden Bay EIA at 203 (estimating that the Discoverer will emit an estimated 25,000 tons of carbon dioxide while the Discoverer and its support vessels will emit almost 60,000 tons per year.)

[53] Hyperion Energy Center BACT Analysis for CO_2 (March 2009) (available at: http://www.hyperionec.com/files/HEC_CO2_BACT_Analysis.pdf) (Attachment 7)

[54] Final Rule Nitrogen Dioxide NAAQS, 75 Fed. Reg. 6474 (Feb. 9, 2010).

> term exposure to NO2, including respiratory effects that can result in admission to a hospital.[55]

EPA ***must*** include a modeling demonstration for this new NAAQS in its final permit for Shell's Beaufort Sea operations. It is likely that the effective date of the new NAAQS will occur prior to issuance of the final permit, therefore EPA cannot ignore the imminent requirement of this very important new health-based standard.[56] EPA's NAAQS, as reported on its website, identifying an effective date for the 1-hour NO_2 NAAQS of January 22, 2010.[57]

In the event that EPA issues Shell's permit prior to the effective date of the new NAAQS, EPA must still require compliance with the standard for its operations in the Beaufort Sea since the regulation will clearly be effective ***before*** Shell's operations begin. Shell must be able to demonstrate compliance with all requirements that are effective during its period of operation.

There is precedent for sources complying with regulatory requirements prior to final agency action. As mentioned earlier, the Hyperion Energy Center in EPA Region 8 voluntarily conducted a BACT determination for CO_2 that was completed because the source "recognize[s] adding CO_2 emissions is an important issue, on which the political, regulatory, and legal framework may be changing."[58]

We would like to see Shell commit to demonstrating compliance with EPA's new 1-hour NAAQS for NO_2, prior to EPA's issuance of a final permit, in recognition of the important health protection measures that such a demonstration will provide. It is important to the residents of the NSB communities that EPA uphold the highest standards of health protection possible.

III. Compliance With The New Prevention of Significant Deterioration Increments for $PM_{2.5}$ Is Also Necessary.

EPA is scheduled to finalize regulations under the Prevention of Significant Deterioration (PSD) program to establish new increments, significant impact levels (SILs) and a significant monitoring concentration (SMC) for $PM_{2.5}$ in June of this year.[59] EPA has proposed a 24-hour Class II increment of 9 $\mu g/m^3$ and an annual Class II increment of 4-5 $\mu g/m^3$.[60] Predicted peak 24-hour average concentrations of $PM_{2.5}$ from Shell's proposed exploration drilling program in the Beaufort Sea are 19.2 $\mu g/m^3$.[61]

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[55] "Fact Sheet Final Revisions to the National Ambient Air Quality Standards For Nitrogen Dioxide" (available online at http://www.epa.gov/air/nitrogenoxides/pdfs/20100122fs.pdf) (Attachment 8).

[56] The effective date of the rule is April 12, 2010.

[57] http://www.epa.gov/air/criteria.html, Footnote 3: "To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010)." (Attachment 8).

[58] Hyperion Energy Center Best Available Control Technology (BACT) Analysis for Emissions of Carbon Dioxide, March 2009, at 2 (Attachment 7).

[59] Projected publication of final rule is June 2010. See http://yosemite.epa.gov/opei/rulegate.nsf/byRIN/2060-AO24?opendocument (Attachment 8).

EPA ***must*** include a modeling demonstration for this new PSD increment in its final permit for Shell's Beaufort Sea operations. Shell cannot ignore the imminent requirement of this new PSD standard. In the likely event that EPA issues Shell's permit prior to the Agency's final decision on the $PM_{2.5}$ increment, EPA must still consider compliance with the increment for Shell's operations in the Beaufort Sea since the regulation will likely be effective during some portion of Shell's operations. Shell must be able to demonstrate compliance with all requirements that are effective during its period of operation.

IV. Shell's Air Quality Permits Must Be Limited To The Lease Blocks For Which Shell Will Seek Authorization To Operate Under OCSLA.

Shell's permit applications and the draft OCS permits issued by EPA are not subject to any specific well sites or time restraints. Rather, each draft permit covers a large number of blocks Shell has leased under various lease sales offered by MMS.[62] Not including more specific terms in the draft Permits is unlawful.

The language in Clean Air Act section 328 specifically limits the definition of "OCS sources" to pollutant-emitting equipment in the OCS that is "*authorized*" under OCSLA.[63] OCSLA in turn requires lessees to identify the particular well sites in which it is seeking authorization to operate.[64] Therefore, Shell's OCS PSD permits must be limited to the specific well sites that Shell delineates in its exploration plans.

In the Beaufort, "Shell proposes to drill two exploration wells on these leases during the July-October 2010 open-water drilling season. One well would be drilled on each of two distinct oil and gas prospects named by Shell as "Sivulliq" (NR 06-04 Flaxman Island, block 6658, OCS-Y-1805) and "Torpedo" (NR 06-04 Flaxman Island, block 6610, OCS-

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[60] 73 FR 54115, September 21, 2007.

[61] EPA Stmt of Basis at 115.

[62] EPA, Region 10, Draft OCS PSD Permit R10OCS/PSD-AK-2010-01 for Shell's Beaufort Sea Exploration Drilling Program at 1 (hereafter "EPA Draft Beaufort Permit"). As the first page of the draft permit for Shell's Beaufort operations demonstrates, Shell is seeking Clean Air Act authorization for ***53 lease blocks*** in lease sales 195 and 202.

[63] 42 U.S.C. § 7627(a)(4)(c)

[64] *See Alaska Wilderness League v. Kempthorne*, 548 F.3d 815, 834 (9th Cir. 2008) ("OCSLA's implementing regulations require that, when evaluating exploration plans, an agency should consider information about "proposed well location and spacing." 30 C.F.R. § 250.203. Exploration plans must be "project specific" and describe the "resources, conditions, and activities" that could be affected. 30 C.F.R. § 250.227. In particular, an EP must include "[a] map showing the surface location and water depth of each proposed well and the locations of all associated drilling unit anchors." 30 C.F.R. § 250.211(b)."), *withdrawn* 559 F.3d 916, *dismissed as moot* 571 F.3d 859; *see also* 30 C.F.R. §§ 250.203, 250.227, 250.211(b).

Y-1941)."[65] In the Chukchi, Shell "proposes to drill exploration wells at up to three of five possible drill sites during the July-October 2010 open-water-drilling season. Three proposed drill sites (one per block) are located on three different blocks (6714, 6764, and 6912) in the Burger Prospect; one drill site is on a single block (6864) in the Crackerjack Prospect; and one drill site is on a single block (7007) in the SW Shoebill Prospect. The total number of wells that would be drilled in 2010 would depend on ice and weather conditions."[66]

The Clean Air Act does not provide the authority to issue a permit for exploration activities beyond those that Shell is seeking authorization for under OCSLA. We request that EPA require OCS PSD permit applicants to submit the specific well blocks for which they will seek authorization to operate under OCSLA in their applications to EPA.

Complying with this limitation in the Clean Air Act is essential in light of the regulation of CO_2, new NO_2 NAAQS, and new $PM_{2.5}$ increments that are discussed above. Emissions of all of these pollutants are about to be subject to very different controls *all during the course of Shell's proposed operations this summer*. For example, if Shell's OCS PSD permits are issued before the greenhouse gas emissions rule is finalized, Shell may escape carbon regulation indefinitely as it pursues its off-shore drilling plans in the Arctic under its current leases. In light of EPA's recent endangerment finding and the acute effects of climate change in the Arctic, EPA should recognize that Shell is intending to conduct a multi-year exploration plan that will include operations well after EPA has promulgated greenhouse gas emissions limitations throughout the country. As a result, it is critical that EPA ensure that any future operations in which Shell wishes to engage will be subject to current Clean Air Act requirements instead of those in place for this permit.

V. BACT Must Be Applied To All The Vessels And Emission Units That Shell Intends To Use In Order To Ensure Compliance With The Clean Air Act.

The Clean Air Act requires Best Available Control Technology (BACT) for both the Discoverer, an OCS source, and its support vessels. Thus, before issuing a Prevention of Significant Deterioration (PSD) permit to a major new stationary source (source), the EPA must conduct a BACT analysis for each pollutant that the source has the potential to emit in significant quantities.[67]

In the draft PSD permit for Shell's Beaufort operations, BACT has been applied to select emission units on-board the Discoverer and to the support vessel only while it is attached to the Discoverer. BACT has not been required for the Discoverer's propulsion engine or the other numerous vessels that are associated with Shell's proposed operations (hereafter ancillary fleet or ancillary vessels). These vessels include two icebreakers, a resupply ship, and an oil response fleet (composed of one offshore management ship and three 34-foot work boats) as well as all the vessels Shell has represented will remain more than 25 miles away from the Discoverer. This is significant because the ancillary vessels account for at least 95 percent of Shell's overall emissions for five of the criteria air pollutants and the emissions from Discoverer's propulsion engine have not been fully calculated.[68]

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[65] MMS, EA Camden Bay at 1.

[66] MMS, EA Chukchi at 5. Specifically, these Prospects are defined as "Posey Blocks 6713, 6714, 6763, 6764, and 6912, Karo Blocks 6864 and 7007, Burger, Crackerjack, and SW Shoebill Prospects, OCS Lease Sale 193, Chukchi Sea, Alaska." *Id.*

[67] 42 U.S.C. § 7475(a)(4).

The ancillary vessels and Discoverer's propulsion engine must be regulated as part of the emissions from the "OCS source." Issuing a permit that fails to require BACT for these vessels and engines would result in violations of section 328 of the CAA, contravene Congress's clear intent to regulate the emissions from vessels associated with drill ship exploration, would be counter to the goals of the PSD program which include protecting public health and welfare, and areas of "regional natural" value,[69] and a misapplication of 40 C.F.R. § 55.2.

A. The Clean Air Act's OCS Definition Encompasses Many of Shell's Activities that Are Not Being Regulated in the Draft Permit.

In section 328 of the Clean Air Act, Congress directed EPA to promulgate regulations to control air pollution over the Outer Continental Shelf (OCS) and provided a broad definition of OCS source:

> The terms "Outer Continental Shelf source" and "OCS source" include any equipment, activity, or facility which--
>
> (i) emits or has the potential to emit any air pollutant,
>
> (ii) is regulated or authorized under the Outer Continental Shelf Lands Act (43 U.S.C.A. § 1331 et seq.], and
>
> (iii) is located on the Outer Continental Shelf or in or on waters above the Outer Continental Shelf.
>
> Such activities include, but are not limited to, platform and drill ship exploration, construction, development, production, processing, and transportation. For purposes of this subsection, emissions from any vessel servicing or associated with an OCS source, including emissions while at the OCS source or en route to or from the OCS source within 25 miles of the OCS source, shall be considered direct emissions from the OCS source.

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[68] *See*, Appendix A, EPA Beaufort Statement of Basis at A-1: Summary of Annual Emissions for the Discoverer and the Associated Fleets. (*i.e.*, the Discoverer is projected to emit 51.23 tons/year of NO_x while the associated fleet is projected to emit 1,320.25 tons/year of NO_x. Overall, Shell's operations will emit 1,371.48 tons/year of NO_x, of which the associated fleet is responsible for 96.3%)

[69] 42 U.S.C. § 7470.

The Conference Report accompanying this provision explains:

> Marine vessels emissions, including those from crew and supply boats, construction barges, tugboats, and tankers, which are associated with an OCS activity, will be included as part of the OCS facility emissions *for the purposes of regulation.* Air emissions associated with stationary and in-transit activities of the vessels will be included as part of the facility's emissions for vessel activities within a radius of 25 miles of the exploration, construction, development or production location. This *will ensure* that *the cruising emissions from marine vessels are controlled and offset as if they were part of the OCS facility's emissions.*[70]

The Conference Report demonstrates Congress' intent to count marine vessel emissions as direct emissions from an OCS source not solely for the purposes of a potential to emit calculation, but also for the "purposes of regulation." The Senate Report confirms Congress's intent to regulate emissions from vessels:

> [A]ll emissions from marine vessels (including engine emissions) which service or are associated with an OCS source, are subject to the same permitting, enforcement, monitoring, reporting, and offset requirements which would apply if these vessels were located in the corresponding onshore (State waters) area. This is intended to include emissions generated while vessels are traveling within the same air basin. These requirements should apply to vessel emissions occurring while at the OCS source, or when en route to or from the OCS source and to or from the corresponding onshore area.[71]

Shell's activities include a fleet of vessels with the potential to emit air pollutants that are regulated under OCSLA pursuant to an Exploration Plan that was approved by MMS, and that are located in the waters above the OCS. In addition to the drill ship the Discoverer, Shell's activities require a whole host of vessels that are servicing and otherwise associated with the drill ship and necessary for the exploration of hydrocarbons. These vessels provide fuel, personnel, supplies, and keep ice away from the drill ship and if need be clean-up oil – all of which are necessary for Shell's operations. Shell's drill ship and ancillary fleet of vessels therefore readily meet the statutory definition of OCS source.

The problem here appears to be the very narrow regulatory definition of OCS source, which only includes vessels when they are:

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[70] 136 Cong. Rec. S16895-01 (Oct. 27, 1990) (emphasis added).

[71] S. Rep. 101-228, 1990 U.S.C.C.A.N. 3385 (Dec. 20, 1989).

(1) Permanently or temporarily attached to the seabed and erected thereon and used for the purpose of exploring, developing or producing resources therefrom, within the meaning of section 4(a)(1) of OCSLA (43 U.S.C. § 1331 et seq.); or

(2) Physically attached to an OCS facility, in which case only the stationary source aspects of the vessels will be regulated.[72]

This regulatory definition is in error. This is evidenced by the preamble to the regulations where EPA explains why it chose to require that vessels be attached to the seabed:

> Section 328(a)(4)(C)(ii) defines an OCS source as a source that is, among other things, regulated or authorized under the OCSLA. The OCSLA in turn provides that the Department of the Interior ("DOI") may regulate "all installations and other devices permanently or temporarily attached to the seabed, which may be erected thereon for the purpose of exploring, developing, or producing resources therefrom, or any such installation or other device (other than a ship or vessel) for the purpose of transporting such resources." 43 U.S.C. § 1333(a)(1). Vessels therefore will be included in the definition of "OCS source" when they are "permanently or temporarily attached to the seabed" and are being used "for the purpose of exploring, developing or producing resources therefrom."[73]

The preamble highlights that EPA developed the requirement that vessels be attached to the seabed because of its (mistaken belief) that DOI only has the authority to *regulate* attached vessels under the OCSLA. OCSLA negates this.

Vessels authorized under OCSLA include not only those attached to the seabed but also those involved with exploration, development, and production.[74] Those activities, as defined under OCSLA, require a number of vessels that are *never* attached to the seabed. For example, "exploration" includes seismic testing with ships,[75] "development" includes "geophysical activity,"[76] and "production" includes "transfer of minerals to shore."[77]

We also point out that the regulatory definition of OCS source is completely inconsistent with the language in EPA's general PSD regulations. There EPA defined a "stationary source" – *i.e.*, one that is subject to regulation under the program – as "any building, structure, facility, or installation," which in turn is defined as "all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control)."[78]

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[72] 40 C.F.R. § 52.2.

[73] 57 Fed. Reg. 40792, 40793 (Sept. 4, 1992).

[74] 42 U.S.C. § 7627(a)(4)(C).

[75] 43 U.S.C. § 1331(k).

[76] 43 U.S.C. § 1331(l).

[77] 43 U.S.C. § 1331(m).

This is an incredibly broad interpretation of the activities that are covered under the PSD program. Indeed, the EPA has determined that facilities a mile or more apart are the same source for purposes of the PSD program.[79] Therefore, it is arbitrary for EPA on the one hand to implement the PSD program broadly on-shore, while narrowing the same program significantly when the activities are occurring offshore. This interpretation is also contrary to Congressional intent that OCS sources comply with the same requirements as non-OCS sources.[80]

This definition of OCS source has caused great confusion with Shell's OCS PSD permit applications and we recommend that EPA return to the language in the statute in deciding which vessel and engines are subject to BACT.

B. We Present Option 3 And Encourage EPA to Adopt it as the Proper Interpretation of When the Discoverer Becomes an OCS Source.

In the proposed OCS PSD permit for Shell's Beaufort Sea exploratory drilling program, EPA has specifically requested comment on when the Discoverer is considered to be an OCS source and has proposed Options 1 and 2.[81] We appreciate the agency's consideration of alternative interpretations of when the Discoverer becomes an OCS source. We encourage EPA to adopt Option 3.

Under Option 3, the Discoverer becomes an OCS source once it enters the 25 mile radius of the drill site and all other ancillary vessels that enter this radius that provide services for the drill rig or otherwise involved in servicing it, are also considered to be part of the OCS source.

We developed Option 3 as an alternative interpretation of when the Discoverer becomes an OCS source to ensure compliance with the plain language of the Clean Air Act in the statutory definition of OCS source.[82] Our review of the options set forth by EPA revealed that Option 1 reflects the same definition of OCS source that EPA proposed in the August 2009 Chukchi draft permit and Option 2 reflects the interpretation Shell has advocated for in its comments on its draft Chukchi permit.[83] Since neither of these options complies with the statutory definition of OCS source, we encourage EPA to adopt Option 3.

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[78] 40 C.F.R. § 52.21.

[79] *See* EPA, Memorandum from Douglas E. Hardesty to Robert R. Robichaud, Re: Forest Oil Kustatan Facility and Osprey Platform Construction Permitting Applicabilitv Determination (Aug. 21, 2001) (Appendix II) (2.8 miles); EPA, Memorandum from Director to Clyde B. Eller, Re: Shell Oil Company Wilmington Complex Specification of "Source" (May 16, 1980) (Appendix II).

[80] *See* Senate Report 101-228, 1990 U.S.C.C.A.N. 3385, 3463 (December 20, 1989) (explaining that "[t]his section of the bill is intended to ensure that air pollution from OCS activities does not degrade the air quality in coastal regions of the United States. This is to be achieved by applying the same air quality protection requirements as would apply if the OCS sources were located within the corresponding onshore area.")

[81] EPA Stmt of Basis at 22-24.

[82] 42 U.S.C. § 7627(a)(4)(C).

Under Option 3 the Discoverer becomes an OCS source when it enters the 25-mile radius of the drill site. Congress intended to regulate drill ship exploration that has the potential to emit air pollutants, is authorized by OCSLA, and is "in or on waters above the Outer Continental Shelf."[84] The propulsion engine on the Discoverer is intrinsic to its operations, and will transport the ship within the 25-mile radius surrounding the drill site, when Shell is moving on to and off the site, and when Shell is moving between lease blocks.[85] Shell's application also states that the rig may need to leave the drill-site and return due to adverse ice conditions or other factors.[86] Thus, the statutory definition of OCS source includes the Discover's propulsion engine as the ship moves within the 25-mile radius of the drill site. These movements of the Discoverer are akin to the type of pre-construction activities that are routinely regulated by EPA under the PSD program.

Inasmuch as these vessels will or may operate within the 25-mile radius of the drill site, they must be regulated as part of the OCS source.

Application of BACT and corresponding onshore area regulations to all the ancillary vessel and propulsion engine emissions is necessary because they are "emissions from [] vessel[s] servicing or associated with an OCS source,"[87] here the Discoverer, "including emissions while at the OCS source"[88] and such emissions "shall be considered direct emissions from the OCS source."[89] The ancillary fleet of vessels provide fuel, supplies, and personnel to the Discoverer and keep ice and oil at bay all of which are "servicing or associated with an OCS source." [90] These emissions therefore, "will be included as part of the OCS facility emissions *for the purposes of regulation*."[91] Since the ancillary vessels are associated with the Discoverer (irrespective of whether they are OCS sources in and of themselves), they are to be considered for regulatory purposes as direct emissions from the source.[92] The statutory definition of "OCS source" does not exempt any activities or parts of an OCS source from the control technologies requirements.[93]

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[83] Shell's comments on the original draft permit for the Chukchi operations included a suggestion that the Discoverer does not become an OCS source until the anchoring process is complete. *See* EPA Revised Stmt of Basis for draft Chukchi Permit at 20.

[84] 42 U.S.C. § 7627(a)(4)(C).

[85] *See* Air Sciences, Outer Continental Shelf Pre-Construction Air Permit Application Revised Frontier Discoverer Chukchi Sea Exploration Drilling Program Prepared for Shell Offshore Inc. at 25 (Feb. 2009) (hereafter "Shell Revised OCS Chukchi App.") (The potential to emit does not include "the Discoverer propulsion emissions for the approximate four hours of time to bring the Discoverer the final 25 miles to the drill site and move it away").

[86] Shell Revised Chukchi OCS App. at 9.

[87] 42 U.S.C. § 7627(a)(4)(C).

[88] 42 U.S.C. § 7627(a)(4)(C).

[89] 42 U.S.C. § 7627(a)(4)(C).

[90] 42 U.S.C. § 7627(a)(4)(C).

Option 3 addresses several of our concerns with the previous interpretation of when the Discoverer becomes an OCS source as put forth by EPA last August. Including the fact that an entire category of unattached vessels that are authorized under OCSLA – *i.e.*, all the equipment and activities that are authorized under the OCSLA but are not attached to the seabed – were impermissibly not counted as part of the OCS source. Option 3 also addresses the concerns raised below with the two options currently provided for consideration.

More importantly, it is critical that emissions that can be regulated under the Act are subject to regulation now, because this permit will set the bar for the myriad of other offshore oil and gas exploration activities that we see coming down the pike.[94] Shell's permit demonstrates the incredibly significant impact just one operator can have on air quality in the Arctic and why it is essential that as many of the emissions from these operations are regulated under the Clean Air Act as possible. It is for this reason that we have been encouraging the EPA to ensure that the emissions from the Discoverer's propulsion engine as well as the emissions from all vessels that are a part of Shell's operations be subject to BACT.

C. Options 1 And 2 Fail to Comply with the Plain Language of the Clean Air Act and do Not Ensure That All of Shell's Emissions are Regulated Once the Discoverer is an OCS Source.

We encourage EPA to adopt Option 3 for regulating the Discoverer as an OCS source because, as discussed below, neither Option 1 nor Option 2 comport with the statutory definition of OCS source or would be protective enough of the air quality in the Arctic.

Under Option 1, the Discoverer becomes an OCS source at the point in time when a single anchor is placed at the drill site and ceases to be an OCS source at the time when the last anchor is removed.[95] Option 1 fails to regulate the emissions from the Discoverer when it engages in pre-construction activities – *i.e.*, movement of the drill rig onto the drill site and construction of the mudline cellar.

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[91] 136 Cong. Rec. S16895-01 (Oct. 27, 1990) (emphasis added).

[92] We also point out that the ancillary vessels are authorized under the Outer Continental Shelf Lands Act (OCSLA) because Minerals Management Service (MMS) must approve Shell's exploration plan and issue a permit to commence exploration before Shell's operations – which the supporting vessels are an essential part of – can commence. *See* 43 U.S.C. § 1340(b).

[93] 42 U.S.C. § 7627(a)(4)(C).

[94] For example, BP is proposing work on the Liberty prospect, and both ConocoPhillips and Statoil are anticipating submitting exploration plans in the near future.

[95] *Id.*

Option 2 provides that the Discoverer becomes an OCS source when an on-site company representative declares that the Discoverer is "secure and stable in a position to commence exploratory activity at the drill site."[96] EPA developed Option 2 in response to Shell's suggestion that until the anchoring process is complete, the Discoverer is not "erected" for the purposes of exploring for resources within the regulatory definition of OCS source.[97]

Presumably, both Options 1 and 2 are based on the narrow regulatory definition of OCS source. Options 1 and 2's basis in the overly narrow regulatory definition instead of the more inclusive statutory definition is unlawful.

As we previously explained, Congress's broad definition of "OCS source" is unambiguous and left EPA with no authority to restrict the definition of "OCS source" to only those vessels that are attached to the seabed floor. This is unlawful for the reasons described by the Supreme Court in *Massachusetts v. EPA*. There, the Court rejected EPA's interpretation that excluded carbon dioxide from the Clean Air Act's broad definition of "air pollutant."[98] The Court found that the inclusive and "sweeping" language in the statutory definition of "air pollutant," specifically "includes any," was unambiguous and precluded EPA's restriction of the definition that excluded "carbon dioxide."

Just as the EPA had in *Massachusetts*, the agency has attempted to interpret and restrict a statutory definition that is unambiguous. The statutory definition of OCS source is an inclusive definition because Congress chose broad language, specifically, "The term[] . . . OCS source' *include[s] any* equipment, activity."[99] EPA has impermissibly restricted the statutory definition of "OCS source" to vessels that are "permanently or temporarily attached to the seabed," in both the regulatory definition of OCS source and its application of the regulatory definition to the Discoverer.[100]

Congress emphasized that the definition is inclusive, not exclusive, when it suggested some of the activities that would fall within the definition: "[s]uch activities include, *but are not limited to*."[101] Because Congress only required that an OCS source meet the three elements listed in (i) - (iii),[102] EPA did not have the authority to limit the definition to those vessels that are attached to the seabed. Nothing in the statutory definition of OCS source suggests that the time at which a drill-ship becomes an OCS source hinges upon whether the vessel is attached to the seabed. In fact, the Discoverer meets the three statutory elements days before the anchoring process even begins, triggering the statute's jurisdiction.

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[96] *Id.*

[97] *Id.* at 20.

[98] *See Massachusetts v. EPA*, 549 U.S. at 528-529 (stating that the CAA definition of "air pollutant" is unambiguous because Congress used inclusive language).

[99] 42 U.S.C. § 7627(a)(4)(C) [emphasis added].

[100] 40 C.F.R § 55.2.

[101] 42 U.S.C. § 7627(a)(4)(C) [emphasis added].

[102] 42 U.S.C. § 7627(a)(4)(C).

The Discoverer clearly meets the definition of an "OCS source" under section 328 of the Act. In order to be subject to the PSD program, the emissions from the Discoverer's engines (minus the propulsion engine) *and* the ancillary vessels were added together and Shell's operations were determined to be a "major source" and thus, subject to regulation under the PSD program.[103] But when it came time to apply control technologies to Shell's operations, the ancillary vessels (aside from the supply vessel when it is attached to Discoverer) were excluded.

With respect to Option 1, there is an internal inconsistency with this option. While the Discoverer is considered to be an OCS source once the first anchor is placed, this Option fails to then require treatment of the "anchor handler" – the icebreaker – as part of the OCS source since it is connected to the Discoverer for the purpose of helping to place the anchors. At the very least, under Option 1 BACT would need to be applied to the Discoverer's propulsion engine (which may be used during anchoring), as well as the "anchor handler," the supply vessel, and all the other engines on the Discoverer for which a BACT analysis was already performed.

With respect to Option 2, it is clear that Shell suggested Option 2 as a way for it to *avoid* having to control the emissions from the Discoverer's propulsion engine. Shell's application for the August 2009 proposed permit stated that the propulsion engine will be shut down before the first anchor is dropped.[104] However, in comments on the August 2009 proposed permit for the Chukchi operations, Shell, MMS, and AEWC highlighted a major problem with this proposal: it prohibited Shell from using the propulsion engines during the anchoring and tensioning process and throughout the exploratory drilling operations:

- MMS "expressed concern" that the permit prohibited the Discoverer from using the propulsion engines after the anchoring process was complete.[105]

- AEWC stated that EPA should consult with the coast guard to determine if it is safe for Shell to discontinue the propulsion engine while setting anchors, especially in rough sea conditions.[106]

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[103] *See* Appendix A, EPA Stmt of Basis at A-1. The supporting vessels will emit the following percentages of the total projected project emissions for each criteria pollutant: 98% of CO, 96% of NOx, 93% of $PM_{2.5}$, 94% of PM_{10}, 90% of VOC, and 91% of lead. Shell estimated that the ancillary vessels have the potential to emit significant amounts of criteria pollutants in an overwhelmingly greater amount than the Discoverer.

[104] Shell Revised OCS App. at 6.

[105] Letter from John Groll, MMS to EPA at 2 (Oct. 2, 2009) (Attachment 9).

[106] *See* AEWC comments at 14 (Attachment 10) (available at: http://www.epa.gov/region10/pdf/permits/shell/chukchi_aewc_icas_nsb_combined_102009.pdf)

- Shell also stated that it would try to comply with the permit requirement not to use the propulsion engines during the anchoring process but if that proved to be dangerous, Shell would request a permit modification.[107]

Based upon these concerns, it is likely that at some point, EPA will have to allow Shell to use the propulsion engine during the anchoring and tensioning process. If this is true, then its emissions must be regulated under the Clean Air Act.

Furthermore, EPA itself has noted that the Discoverer can safely drill before all eight anchors are placed.[108] Thus, Option 2 presents a scenario for regulation that is even more restrictive than that provided in the regulatory definition of OCS source since it requires both attachment to the seabed floor and a declaration of position. Basing the regulation of the Discoverer on this Option would readily be found to violate not only the plain language of the statute but also EPA's regulation.

Presumably BACT and corresponding onshore area regulations were not applied to the ancillary vessels based on EPA's application of its regulatory definition of "OCS source,"[109] to Shell's proposed operations. The regulatory definition as applied here violates the plain language of the statute.[110]

2. EPA Failed to Consistently Apply the COA Regulations to Shell's Ancillary Vessels

EPA promulgated 40 CFR Part 55 to establish requirements to control air pollution from OCS sources in order to ensure attainment and maintenance of Federal and State ambient air quality standards and to comply with the provisions of Part C of Title I of the Clean Air Act. EPA recently finalized an update to these regulations in response to a Notice of Intent filed by Shell Offshore, Inc. on January 9, 2009.[111] EPA applied the requirements in 40 CFR 55 to the sources on the Discoverer but failed to apply all applicable COA regulations to the ancillary vessels supporting the OCS source, as intended by Section 328 of the CAA.

("Typically large vessel propulsion engines continue to operate while anchors are set and are started prior to releasing anchors, this way the captain has full control of the vessel while anchors are set and released. Setting a large drillship adrift in heavy ice conditions without an operational propulsion systems does not appear to be a safe plan.")

[107] EPA Chukchi Revised Stmt of Basis at 20.

[108] EPA Stmt of Basis at 23 (citing United States Patent No. 4,509,448).

[109] *See* 40 C.F.R. § 55.2.

[110] *See* 42 U.S.C. § 7627(a)(4)(C).

[111] 75 Fed. Reg. 3387(Jan. 21, 2010), effective February 22, 2010.

EPA must apply the applicable legal requirements of the State of Alaska that were Incorporated by Reference into 40 CFR 55, effective February 22, 2010, to ***all*** of the ancillary vessels in Shell's exploratory drilling program. This would include, for example, applying the COA incinerator visible emissions regulations (18 AAC 50.050) found in Condition K.11 of the proposed permit to the incinerators found on the two icebreakers (e.g., TV-8 of the Tor Viking) and the oil response vessel (N-6). It would also include the addition of all fuel-burning emission sources from the supply ship (e.g., FD-31), the two icebreakers (e.g., units TV 1-7 of the Tor Viking) and the OSR fleet (e.g., units PBT 1-4, units AEB 1-4, units N 1-5, units K 1-6 and units R 1-3) to the list of sources subject to the PM, SO_2 and visible emissions standards, monitoring, recordkeeping and reporting requirements in proposed Permit Conditions B.8, B.9, B.12, B.13, B.14, B.15, B.16 and B.17.

V. The Potential To Emit Calculations Fail To Account for All of Shell's Proposed Operations.

As an initial matter, we commend EPA for its clarification of how and why nonroad engines are a part of the Potential to Emit calculations for OCS activities.[112] We agree that "the exclusion of nonroad engines from the general definition of 'stationary source' in Section 302(z) of the CAA is overridden by the more specific provisions in Section 328 of the CAA and 40 C.F.R. § 55.2."[113]

Our concerns with the existing PTE calculations are with the exclusion of the Discoverer's propulsion engine and other vessels and contingencies from Shell's overall potential to emit calculations. With respect to the Discoverer's propulsion engine, as discussed previously, because this engine is part of the drill rig and used in the "construction" and "transportation" of the drill rig, its potential to emit needed to be calculated so BACT could be applied to its emissions.[114] Similarly, a Marine Mammal Observer vessel is listed as part of Shell's proposed operations.[115] It does not appear that the emissions from this vessel were included in the PTE.

Emissions associated with emergency situations, namely oil spills, were not included in the PTE. An oil spill or some other similar emergency situation would result not only in additional, unaccounted for vessel emissions but also emissions from, for example, in situ burning of spilled materials. Major sources of air pollution cannot automatically escape regulation or liability for excess emissions resulting from foreseeable or unforeseeable circumstances.

Under the PSD program, EPA has maintained a longstanding policy that the Clean Air Act does not allow automatic exemptions for excess emissions during startup, shutdown, and malfunction (SSM) events.[116] Recently, the Tenth Circuit in *Arizona Public Service Co. v. U.S.* highlighted that the agency's "longstanding policy makes clear that excess emissions resulting from malfunctions are violations of the Clean Air Act, for such emissions can interfere with attainment of the national air standards."[117] The EAB relied upon this policy to remand a PSD permit that included a provision exempting a coal-fired steam electric generating station from otherwise applicable emissions limits during SSM events.[118]

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[112] EPA Stmt of Basis at 25-26.

[113] *Id.* at 23.

[114] 42 U.S.C. § 7627(a)(4)(C).

[115] Shell Camden Bay EIA at 22.

Just as startup, shutdown, and malfunction events can be foreseen and planned for at a coal-fired power plant, they can be foreseen and planned for as part of an oil spill response event at an off-shore drilling site. Indeed, several legal requirements mandate that Shell meticulously plan for a response to an oil spill.[119] Because an oil spill is such a likely, and not merely an unforeseeable event, Shell is employing an entire "oil spill response" (OSR) fleet as part of its proposed operations. One of the OSR vessels, the Nanuq, will be positioned about 5,000 meters away from the Discoverer and will be used to conduct "on-water drills" for training, approximately 8-hours at a time, no more than once per day.[120]

Shell's response to an oil spill would release a large quantity of emissions that are unaccounted for in the draft Permit. By moving the entire OSR fleet to the drill site, cleaning up oil, and conducting other response activities, the OSR fleet will release air emissions by using the propulsion engines, generators, and other equipment. Moreover, Shell has suggested that it will burn spilt materials (*i.e.*, oil and/or gas) as a method to clean up a spill, certainly resulting in even more significant air emissions.[121] To provide Shell with an automatic exemption for these excess emissions would be contrary to EPA's longstanding policy under the PSD program and would violate the Clean Air Act. Excess emissions resulting from an oil spill response could have the potential to violate the national ambient air quality standards and other Clean Air Act requirements, thus Shell's permit must account for these emissions.

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[116] *See, i.e., Indeck-Elwood, LLC*, PSD Appeal No. 03-04, Slip Op. at 66 (Sept. 27, 2006) ("Indeed, EPA has, since 1977, disallowed automatic or blanket exemptions for excess emissions during startup, shutdown, maintenance, and malfunctions by defining most periods of excess emissions as "violations" of the applicable emission limitations."), citing *In re Tallmadge Generating Station*, PSD Appeal No. 02–12, at 24 (EAB, May 21, 2003) (stating that EPA has issued several guidance documents over the years "clearly expressing the Agency's long-standing position that automatic exemptions for excess emissions during startup and shutdown periods cannot be reconciled with the directives of the CAA.").

[117] 562 F.3d 1116 (10th Cir. 2009); *See also* 72 Fed. Reg. at 25,702, 25,705; State Implementation Plans: Policy Regarding Excessive Emissions During Malfunctions, Startup, and Shutdown (Sept. 20, 1999) (hereinafter Herman Memorandum); Policy on Excess Emissions During Startup, Shutdown, Maintenance, and Malfunctions (Feb. 15, 1983) (hereinafter Bennett Memorandum).

[118] *Indeck-Elwood, LLC*, PSD Appeal No. 03-04, Slip Op. at 71, 76 (Sept. 27, 2006).

[119] *See e.g.*, Shell Beaufort Sea Regional Oil Discharge Prevention and Contingency Plan (ODPCP) (April 2007) (available at:

http://www.mms.gov/alaska/ref/ProjectHistory/Shell_BF/2007_cplan.pdf) (Attachment 13).

[120] EPA Stmt of Basis at 59.

[121] Shell, Beaufort ODPCP at 1-27, 1-29, 1-51, 1-53, 1-86; § 1.7 at 1-95 to 1-96, 3-16, 3-20 to 3-36 (available at:

http://www.mms.gov/alaska/ref/ProjectHistory/2009_Chukchi_Shell/2009_0623_Shell_cplan.pdf).

Specifically, the OSR fleet's activities and the impacts of burning spilt materials resulting from an oil spill response must be included in the potential to emit analysis. "Potential to emit" means "the maximum capacity of a source to emit a pollutant under its physical and operational design."[122] By employing and training the OSR fleet, Shell has included an oil spill response within the operational design of the OSR fleet. Because these activities fall within the operational design, they increase the maximum capacity of Shell's operations and must be accounted for in the PTE.

The EPA concludes that

> There are other vessels that will be associated with Shell's exploratory drilling program, such as an oil tanker, a barge, and shallow water landing craft. Based on Shell's application submittals, none of these vessels will be operating within 25 miles of the Discoverer while the Discoverer is an OCS source. Emissions from these other vessels are therefore not included in determining the potential to emit of Shell's exploration drilling program in conjunction with applying the requirements of the OCS or PSD program.[123]

Shell needs to explain whether these vessels will be used within 25 miles of the Discoverer in the event of an oil spill or other emergency situation. If so, the emissions from these vessels must be included in Shell's PTE.

As EPA explained, "determining a project's PTE is essential for determining . . . the scope of PSD review, in particular, the pollutants that are subject to application of BACT, analysis of ambient air quality impacts from the project, . . . and analysis of impacts on soils and vegetation."[124] Due to the importance of the PTE calculations, it is imperative that these issues are addressed with Shell and a permit is proposed for public input that takes *all* of Shell's proposed emissions into account as required by the Clean Air Act.

1. A Calculation of Shut Downs and Start Ups in Light of Mitigation Measures that Will be Necessary to Protect Marine Mammals is also Necessary.

Shell states in its permit application that while "[s]ounds from the *Discoverer* have not previously been measured in the Arctic or elsewhere," "mitigation as described for seismic activities including ramp ups, power downs, and shut downs should not be necessary for drilling activities".[125] We disagree that the now typical mitigation measures for activities in the Arctic – *i.e.*, of powering or shutting down when marine mammals are sited and powering up when the marine life has moved on – will not be required of Shell for its drilling operations. We ask that EPA ensure that ramp downs and ramp ups, and shut downs and start ups be taken into account in determining the emissions from Shell's operations, as well as the necessary best available control technologies.

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[122] 40 C.F.R. § 52.21(b)(4).

[123] EPA Stmt of Basis at 26.

[124] EPA Stmt of Basis at 32.

VI. In Several Instances A BACT Analysis Was Not Performed For Emissions Units And In Other Instances Improvements Are Required For The Analysis That Was Performed.

For all sources subject to BACT, EPA must establish an "emission limitation based on the maximum degree of reduction" for each pollutant that the source will emit in significant quantities.[126] To determine the appropriate emission limitation, the EPA may take into account, "energy, environmental, and economic impacts and other costs."[127] In doing so, the EPA must adequately justify and explain its decision to eliminate control technologies due to technical infeasibility or collateral impacts.[128]

In applying BACT here, EPA utilized the top-down approach.[129] As EPA explained in its New Source Review Workshop Manual:

> the top-down process provides that all available control technologies be ranked in descending order of control effectiveness. The PSD applicant first examines the most stringent--or "top"--alternative. That alternative is established as BACT unless the applicant demonstrates, and the permitting authority in its informed judgment agrees, that technical considerations, or energy, environmental, or economic impacts justify a conclusion that the most stringent technology is not "achievable" in that case. If the most stringent technology is eliminated in this fashion, then the next most stringent alternative is considered, and so on.[130]

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[125] Shell Beaufort Sea Marine Mammal Monitoring and Mitigation Plan at 13. We also point out that Shell has previously noted that "[t]he presence of MMOs onboard drilling and support vessels will be a core component of compliance with the 4MP. The MMOs will be responsible for collecting basic data on observations of marine mammals and for implementing mitigation measures including vessel avoidance measures and factored into *decisions concerning operational shutdown*." Shell Revised Chukchi OCS App. at 145 (emphasis added).

[126] 42 U.S.C. § 7479(3).

[127] *Id.*

[128] *In re: Knauf Fiber Glass, GMBH*, 8 E.A.D. 121, 131 (Feb. 4, 1999) (remanding a PSD permit to the permitting agency).

[129] *See* EPA, New Source Review Workshop Manual (1990) (available at: http://www.epa.gov/ttn/nsr/gen/wkshpman.pdf).

[130] *Id.* at B.2.

Thus, BACT requires that EPA do more than summarily dismiss technologies and instead provide "a clearly ascertainable basis for a conclusion."[131] In *Knauf Fiber Glass*, the Environmental Appeals Board was unable to ascertain whether a PSD permit included the best available control technology for the source because the permitting authority did not provide proper documentation of the potential control technologies and a technical feasibility analysis. The EAB required the permitting authority to conduct a supplemental BACT analysis that included a list of control options, an explanation of the technical feasibility analysis, and justifications for eliminating control options.[132]

In Shell's draft permit, EPA purports to have set BACT for all required sources. A rigorous analysis must be undertaken to arrive at BACT for *all* required sources. In situations like this, the EAB has emphasized that an agency's less than rigorous analysis is not BACT:

> If reviewing authorities let slip their rigorous look at 'all' appropriate technologies, if the target ever eases from the 'maximum degree of reduction' available to something less or more convenient, the result may be somewhat protective, may be superior to some pollution control elsewhere, but it will not be BACT.[133]

In Shell's draft permit, EPA has not yet met the rigorous BACT demands because the agency still has not: (1) adequately supported its decision to eliminate the best available control technology for several engines and pollutants; and (2) conducted BACT for the propulsion engines and ancillary vessels.

A. The Proposed Best Available Control Technology (BACT) Emission Limits Do Not Necessarily Reflect the Maximum Level of Control that Can be Achieved.

1. NO_x BACT analysis for the six generator engines

We support EPA's determination of BACT as the use of selective catalytic reduction (SCR) to reduce NO_x emissions from the six generator engines on board the Discoverer. We question, however, if the associated permitted emission rate of 0.5 g/kW-hr (Permit Condition C.3.1) is the appropriate corresponding emission limit for the proposed system. Statements from the vendor, D.E.C. Marine, indicate that the SCR system can achieve an emission rate as low as 0.1 g/kW-hr under ideal steady state conditions.[134] This represents a limit that is 80% lower than what is proposed as the permit limit for these units. It is quite possible that the units will, in reality, operate at a level lower than the guaranteed 0.5 g/kW-hr emission rate. We support EPA's requirement to test theses engines (Condition C.6) to verify emission limits can be achieved; however, these data are needed *prior* to issuing a permit in order to set an appropriate BACT limit. In the event that the test data for these units demonstrate the ability to meet a lower NO_x limit than the proposed 0.5 g/kW-hr, EPA must revise the BACT limit accordingly.

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[131] *In re: Knauf Fiber Glass*, 8 E.A.D. at 134.

[132] *Id.*

[133] *In re: Northern Michigan University Ripley Heating Plant*, PSD Appeal No. 08-02, Slip Op. at 16, 14 E.A.D. --- (EAB Feb. 18, 2009).

[134] EPA Stmt of Basis at 68.

Additionally, it seems possible that exhaust gases from other emission units could be routed to and treated by the SCR systems for the generator engines. Since it was deemed infeasible to install SCR for the smaller compression ignition internal combustion engines on board the Discoverer primarily due to space considerations, please provide justification for why these engines can't use the same SCR system employed for the generator engines.

2. NO_x BACT analysis for smaller compression ignition internal combustion engines.

EPA's proposed BACT for the smaller compression ignition engines on the Discoverer is "good combustion practices."[135] This BACT determination applies to the hydraulic power unit (HPU) engines, cranes, cementing units and logging winches, which collectively represent over 80 percent of the impact to maximum annual NO_x concentrations from Shell's exploration activities.[136] According to Shell's application for the Beaufort Sea, "[m]aximum impacts for annual NO2 are driven by poorer dispersing engines (HPU engines and cementing units) on the *Discoverer*".[137] We do not support EPA's conclusion that simply employing "good combustion practices" for all of these engines is the best available control technology.

In particular, we think EPA should reconsider the option for re-powering the two HPU units as BACT for these engines. The HPU's are prime candidates for re-powering to Tier 3 engines and, in fact, Shell indicates that the only technical consideration is the "additional effort [that] would be necessary to attach all the necessary hydraulic lines and other associated equipment."[138] The cost-effectiveness for these engines – at less than $10,000 per ton of NO_x removed - is favorable, contrary to Shell's conclusions. Shell states, in its BACT report that:

> In conclusion, none of the engine replacement options evaluated are less than $10,000 per ton of NO_x removed. Given the very small quantity of

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[135] *See* EPA Stmt of Basis at 73; EPA draft OCS PSD Proposed Permit for Shell Beaufort Sea Operations, at Conditions G.3, H.3 and I.3.

[136] Shell supplemental material from the Chukchi permit, September 17, 2009, Table 7-4: Discoverer Source Contributions at the Screening Maximum Impact Locations

[137] Outer Continental Shelf Pre-Construction Air Permit Application for the Frontier *Discoverer* Beaufort Sea Exploration Drilling Program, ENVIRON Project No. 03-22090A, Revised January 2010, p. 168.

[138] ENVIRON report: Diesel Engine Best Available Control Technology Analysis, December 2009, Project No. 0322090A, p. 21.

> NO_x that would be eliminated by these engine replacements, engine replacement is not cost effective and not BACT.[139]

Re-powering the HPU units, in fact, does appear to be cost effective according to Shell's own evaluation. Shell's updated BACT analysis contained in the permit record estimates a cost for re-powering the HPU units at $8,671 per ton of NO_x removed (clearly less than $10,000 per ton).[140] If $10,000 per ton is the threshold of consideration, as implied in Shell's assertion, then certainly this alternative must be more seriously considered. In fact, EPA did not even address this alternative in the statement of basis for the proposed permit. We disagree with Shell that the small quantity of NO_x emissions that would be removed justifies an argument for eliminating this alternative as BACT when, in fact, the HPU units contribute 30% of the maximum modeled NO_x concentrations from Shell's activities.[141]

If, however, EPA does not revise BACT for the HPUs to require re-powering of the engines to Tier 3 engines then it must at least consider re-tooling these and other engines as BACT instead of simply employing "good engineering practices." Specifically, the Cam Shaft Cylinder Reengineering (CCSC) kit suggested by us in our prior comments on the Chukchi Sea proposed permit appears to be a cost-effective BACT alternative for the HPU engines as well as the two larger cementing units. Even considering the slightly higher cost per ton of NO_x reduction than for re-powering the HPUs, which includes Shell's estimated [$50,000] shipping costs for installing the re-tooling kits, we believe this is a viable option that could (and should) be considered as BACT for these units. The fact that this re-tooling option has had successful test results in Arctic conditions and there appear to be no issues with the use of ULSD further supports its use in Shell's specific application. EPA must identify the potential emission limits that would result from re-tooling these specific units. If EPA believes this alternative is not cost-effective then it must provide a more thorough justification for this position including specific examples of cases where these levels of cost ($/ton of removal) were rejected as not cost-effective. Again, we do not agree with Shell's recommendation that these "small and infrequently used" engines do not warrant further consideration of BACT alternatives. The HPUs and cementing units make up 64% of the maximum-modeled NO_x concentrations from Shell's activities.[142]

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[139] There appear to be two versions of this report. The one included in the Chukchi Permit Administrative Record is titled the same but includes a threshold of $10,000 per ton, as quoted here - ENVIRON report: Diesel Engine Best Available Control Technology Analysis, December 2009, Project No. 0322090A, p. 23.

[140] *See* Outer Continental Shelf Pre-Construction Air Permit Application for the Frontier *Discoverer* Beaufort Sea Exploration Drilling Program, ENVIRON Project No. 03-22090A, Revised January 2010, p. 69 *and* ENVIRON report: Diesel Engine Best Available Control Technology Analysis, December 2009, Project No. 0322090A, see p. 15 Table 4-1.

[141] Shell supplemental material for the Chukchi permit, September 17, 2009, Table 7-4: Discoverer Source Contributions at the Screening Maximum Impact Locations

[142] *Id.*

The various engines covered by this general BACT determination continue to have permitted emission rates, which are defined as BACT limits, as follows:

Unit	NO_x BACT Limit in g/kWh	Permit Condition
HPU Engine FD-12	13.155	G.2.2.1
HPU Engine FD-13	13.155	G.2.2.1
Deck Crane FD-14	10.327	H.2.2.1
Deck Crane DF-15	10.327	H.2.2.1
Cementing Unit FD-16	13.155	I.2.2.1
Cementing Unit FD-17	13.155	I.2.2.1
Cementing Unit FD-18	15.717	I.2.2.1
Logging Winch FD-19	4.0	I.2.2.1
Logging Winch FD-20	7.5	I.2.2.1

According to EPA and Shell, the hydraulic power units (HPU) will be used "very similarly" to the MLC compressor engines.[143] The HPU engines are 250 hp Detroit Diesel 8V-71 engines and the BACT limit is based on engine dynamometer test data reported in EPA's 2002 Diesel Health Assessment. The cementing unit engines (FD-16, FD-17, FD-18) and logging winch engine FD-19 are also Detroit Diesel 8V-71 engines (or from the same "family" of engines) with BACT limits also based on EPA's 2002 Diesel Health Assessment data.

The BACT limits for the FD-20 logging winch and the two deck cranes are based on manufacturer emission data and likely represent good combustion practices. These BACT limits are lower than for the other engines. EPA's proposed BACT limits for the Detroit Diesel 8V-71 engines may not reflect the "good combustion practices" that it determined were the best available controls. At a very minimum, EPA must quantify the reductions in NO_x emissions that can be expected from implementation of the good combustion practices defined as BACT instead of requiring the practices but enforcing an emission limit that is simply based on average engine operation for these 8V-71 engines. We support EPA's requirement to test theses engines (Conditions G.7, H.7 and I.7) to verify emission limits can be achieved; however, these data are needed prior to issuing a permit to set a BACT limit and determine BACT. In the event that the test data for these units demonstrate the ability to meet lower NO_x limits, EPA must revise the BACT limits accordingly.

Thus, for these reasons, EPA still has not adequately evaluated BACT for NO_x for the small compression ignition engines. We request that EPA re-consider its review of BACT for these engines, per 40 C.F.R. § 52.21(b)(12). EPA has failed to show that the proposed emission limits reflect the maximum degree of NO_x reduction that can be achieved from these engines (in fact, they appear to only reflect average operation of these engines) and has failed to consider all technically and economically feasible control options. We request that EPA determine the level of control that reflects the maximum degree of NO_x reduction that can be achieved from these small engines and impose a NO_x emission limit that reflects that maximum degree of NO_x control.

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[143] *See* EPA Stmt of Basis at 47.

3. PM BACT analysis for diesel generator engines.

EPA is proposing the use of oxidation catalysts (OxyCat) as BACT for the six generator diesel internal combustion engines.[144] EPA eliminated the use of catalytic diesel particulate filters (CDPF) as technically infeasible control options for these engines. EPA did not include any additional analysis of BACT alternatives for these engines in the proposed permit documents. We would like EPA to more thoroughly evaluate CDPF as BACT for these engines, particularly given that they contribute 30% of the maximum concentrations of PM from Shell's activities.[145] According to EPA, "[s]ince CDPF systems are not commercially available in combination with SCR systems for diesel engines such as the Discoverer's generator diesel IC engines, EPA believes CDPF systems are technically infeasible for this specific application."[146] Further, EPA assumes that even if CDPF technology were technically feasible, it would not be a cost-effective control option.[147]

Regarding EPA's reference to cost-effectiveness for CDPF control for the six generator engines, EPA must provide a comparative assessment of the economic impacts of applying this technology in similar applications. Shell provided a cost estimate for the use of CDPF control for the six generator engines of roughly \$22,000 per year per ton of PM removed for all six engines.[148] In its application, Shell simply states "[t]his cost is considered too high to be required as BACT".[149] If EPA is going to eliminate the use of CDPF technology as an effective control option based on cost-effectiveness then it must present a detailed argument as to why \$22,000 per ton of PM removed per year is not considered cost effective for these units. This argument must include an analysis of employing these technologies for Shell's proposed operations in the Chukchi Sea as well. EPA must compare the associated per ton costs with similar applications of CDPF.

According to EPA guidance, the applicant must demonstrate that costs of pollutant removal are "disproportionately high when compared to the cost of control for that particular pollutant and source in recent BACT determinations."[150] EPA and Shell have provided no such comparison analysis to support its claim that \$22,000 is not cost effective. In fact, it does not appear that \$22,000 per ton of PM removal per year is necessarily cost prohibitive. EPA estimates that the cost of several diesel retrofit programs: (1) the Urban Bus Retrofit and Rebuild program ($31,500/ton of PM reduced); (2) the 2007 Heavy-Duty diesel emission standards ($14,200/ton); and (3) the Non-road Tier 4 emission standards ($11,200/ton) indicate that "retrofits can be a cost effective way to reduce air pollution."[151]

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[144] *See* EPA Stmt of Basis at 79; EPA Draft Beaufort Permit at Condition C.2.

[145] Shell supplemental material for the Chukchi Sea permit, September 17, 2009, Table 7-4: Discoverer Source Contributions at the Screening Maximum Impact Locations.

[146] EPA Stmt of Basis at 79.

[147] *See* EPA Stmt of Basis at 79, fn15.

[148] *See* Shell Beaufort Air Permit at 58 and Appendix C.

[149] *See* Shell Revised Chukchi OCS App. at 47.

[150] Draft NSR Workshop Manual, at B.32 (October 1990).

Regarding EPA's determination that CDPF technology is technically infeasible, it is not sufficient to simply provide one manufacturer's statement that it is unaware of CDPF applications for these engine types.[152] In addition to comparing the proposed BACT determination to the BACT determinations of other permitted sources, the BACT analysis should also be based on a review of the maximum degree of emission reductions that can be achieved for the engines based on a rigorous investigation of all available control options. EPA and Shell must more thoroughly investigate the use of CDPF in application where Selective Catalytic Reduction (SCR) is also used to control NO_x in determining the BACT limits for these engines.

Several manufacturers have demonstrated commercial CDPF retrofit applications in conjunction with SCR to control NO_x emissions demonstrating that many of the technical considerations that Shell raises (e.g., backpressure on the engines, cross-sectional area for the catalyst matrix, filter element exchange frequency, etc.) can be overcome. These applications were for a wide range of engine sizes and a wide range of ages.[153] And there is recent research to support the effectiveness of integrated catalytic control systems for NO_x and PM reduction in both stationary and mobile applications for small and large engines.[154] However, even if these particular technologies are not directly applicable to the older generator engines proposed for use by Shell, it is still possible that the use of CDPFs is potentially feasible for these engines. Nothing in the permitting materials indicates with certainty that this particular technology is technically infeasible. Without such firm evidence EPA must insist that Shell perform the needed investigations to make a more solid determination.

4. PM BACT analysis for the incinerator.

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[151] EPA 420-S-06-002, Diesel Retrofit Technology: An Analysis of the Cost-Effectiveness of Reducing Particulate Matter Emissions from Heavy-Duty Diesel Engines Through Retrofits, March 2006, p. ii (Attachment 14).

[152] EPA Stmt of Basis at 78-79: "D.E.C. Marine stated that they are not aware of any applications of CDPF systems on older heavy duty marine engines without modern electronic controlled fuel injection."

[153] *See, e.g.*, EPA's Emerging Technology list available at: http://www.epa.gov/otaq/diesel/prgemerglist.htm (Attachment 15).

[154] Gekas I P, "NOx Reduction Potential of V-SCR Catalyst in SCR /DOC/DPF Configuration Targeting Euro VI Limits from High Engine NOx Levels", Society of Automotive Engineers (SAE), Document Number: 2009-01-0626, April 2009 (Abstract available online at http://www.sae.org/technical/papers/2009-01-0626) (Attachment 16); Servati H B, Petreanu S,Marshall S E,Su H, Marshall R, Wu C-H, Hughes K, Simons L, Berrimann L, Zabsky J, Gomulka T, Rinaldi F, Tynan M, Salem J, Joyner J, "A NOx Reduction Solution for Retrofit Applications: A Simple Urea SCR Technology", SAE, Document Number: 2005-01-1857, April 2005 (Abstract available online at http://www.sae.org/technical/papers/2005-01-1857) (Attachment 17).

EPA is continuing to propose "Good Combustion Practices" as BACT for the incinerator.[155] This is the same BACT as proposed by Shell in its application.[156] EPA eliminated the use of add-on controls for the incinerator as technically infeasible. The Discoverer incinerator (TeamTec GS500C) is a small waste incinerator rated at 276 lb/hr, with a daily rating of 6,624 lbs/day. Shell plans to incinerate domestic and other non-hazardous solid waste (trash) and liquid sewage sludge. Shell describes this incinerator as a two-stage, batch-charged unit. The TeamTec GS500C unit is a small unit (approximately 8'x 6'x 7' in dimension) with an option for simultaneous combustion of sewage sludge and solid waste.[157]

Shell requested Owner Requested Restriction (ORR) limits for PM_{10} (8.2 lbs/ton) and $PM_{2.5}$ (7 lb/ton), which is a small fraction of the total AP-42, Table 2.2-1 PM_{total} emission factor for an uncontrolled multiple hearth sewage sludge incinerator (100 lb/ton). It is not clear how fine particulate matter will be controlled to this level without the use of additional controls.

Shell has also requested an ORR of 1,300 lb/day (20% incinerator capacity) in addition to the ORR limits for PM_{10} and $PM_{2.5}$.[158] Even at these ORRs the incinerator $PM_{2.5}$ emissions account for up to 30% of the 24-hour $PM_{2.5}$ (and PM_{10}) concentrations at maximum impact locations under Alternative Operating Scenario #2.[159]

Both Shell and EPA conclude that no additional control is BACT, but do not explain how these ORR emission factors will be achieved absent additional control. Vendor data and source test data is absent to confirm these ORRs can be achieved. We support the EPA's requirement to test the incinerator (FD-23) to verify whether emission limits can be achieved (Condition K.9); however, these data are needed prior to issuing a permit to set a BACT limit and determine BACT.

The permit does not include an alternative procedure if the test fails to achieve the ORRs. One option would be to further reduce the incinerator throughput, but it is not clear whether further reduction below a 20% operating capacity can support the vessel's waste generation. Another option would be to develop alternative waste handling strategies to reduce waste capacity including collection and backhaul, if needed, rather than on-site incineration. These alternative requirements should be clearly specified in the permit.

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[155] EPA Stmt of Basis at 85; EPA draft OCS PSD Proposed Permit Shell for Beaufort Operations at Condition K.2.

[156] Outer Continental Shelf Pre-Construction Air Permit Application for the Frontier *Discoverer* Beaufort Sea Exploration Drilling Program, ENVIRON Project No. 03-22090A, Revised January 2010, p. 96.

[157] TeamTec Marine Product Brochure (Attachment 18).

[158] EPA Proposed Permit Condition K.7.1

[159] Shell Supplemental Materials for the Chukchi Sea permit at Table 7-4 Discoverer Source Contributions at the Screening Maximum Impact Locations (9/17/09).

We request that EPA require Shell test this incinerator to verify what emission rate can be achieved, or provide vendor data to verify that the PM_{10} (8.2 lbs/ton) and $PM_{2.5}$ (7 lb/ton) ORRs can be met without any additional emission control. Additional control may be required to achieve these emission levels. Or alternative waste handling strategies may need to be adopted.

In the event that the test data for the unit demonstrate the ability to meet lower PM_{10} and $PM_{2.5}$ limits, EPA must revise the BACT limits accordingly. In fact, Shell's own findings in the RACT/BACT/LAER clearinghouse demonstrate that lower limits can be achieved on similar-sized units using "Proper Operation and Maintenance" practices. Specifically, similar waste combusting units permitted at the Kenai Refinery in Alaska with 350 lb/hr maximum throughput ratings have a BACT limit for PM_{10} of 0.2 lb/hr, or 1.1 lb/ton.[160,161] EPA should consider and evaluate this limit as an applicable BACT limit for the incinerator on the Discoverer.

We commend EPA for requiring a standard operating procedure/waste separation plan to instruct employees on how to segregate waste to ensure that hazardous/toxic material is not inadvertently incinerated (Proposed Permit Condition K.8).

5. Incinerator SO_2 emissions.

Shell references an owner requested limit as the source of its emission factor for SO2 emissions from the incinerator.[162] However, this number appears to be based on AP-42, Table 2.1-12 yet it is not clear why Shell uses this "D" rated emission factor for a refuse combustor of 2.5 lbs/ton rather than the "B" rated emission factor of 28 lb/ton found in Table 2.2-1 for a multiple hearth sewage sludge incinerator (which is 11 times larger).[163] If Shell has reduced this emission factor based on fuel type, this must be explained.

6. Incinerator sewage combustion.

We request that EPA clarify the amount and type of sewage that will be incinerated in Discoverer incinerator versus treated by the Marine Sanitation Device (MSD) and discharged overboard as described in Shell's NPDES NOI. In our comments on the NPDES permit, we have requested additional information on the type and treatment levels achieved by the Marine Sanitation Device (MSD).

7. PM BACT analysis for boilers.

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[160] RBLC, AK-0053, 3/21/2000

[161] $0.2\ lb_{PM10}/hr\ /\ 350\ lb_{waste}/hr * 2000\ lb/ton = 1.1\ lb_{PM10}/ton_{waste}$

[162] per Shell 5/18/2009 Response to EPA R10 March 11, 2009, Letter of Incompleteness, Attachment D, Page 3.

[163] EPA Chukchi Stmt of Basis Appendix A.

EPA is proposing "Good Combustion Practices" as BACT for the two boilers onboard the Discoverer.[164] EPA eliminated the use of add-on controls for the boilers as technically infeasible.

As with the incinerator, we support EPA's requirement to test the boilers (FD-21 and FD-22) to verify that BACT emission limits can be achieved (Condition J.5); however, these data are needed ***prior*** to issuing a permit to set a BACT limit and determine BACT. We request that EPA require Shell test both units to verify what emission rate can be achieved, or provide vendor data to verify that the PM_{10} (0.0235 lb/mmBTU) and $PM_{2.5}$ (0.0235 lb/mmBTU) limits can be met without any additional emission control.

In the event that the test data for the units demonstrate the ability to meet lower PM_{10} and $PM_{2.5}$ limits, EPA must revise the BACT limits accordingly. EPA must also explain why the proposed BACT limits exceed AP-42 emission factors for this source. Table 1.3-1 in Section 1.3 of EPA's AP-42 compilation of emission factors lists "A" rated emission factors for NO_x and PM_{10} of 20 pounds per thousand gallons ($lb/10^3gal$) and 2 $lb/10^3gal$, respectively.[165] AP-42 emission factors represent an average of a range of emission rates. Therefore, units applying BACT would presumably be able to achieve much lower emission rates than what is presented as the average factor in AP-42. The proposed BACT limits for the two boilers, in comparison, are equivalent to 26.6 $lb/10^3gal$ of NO_x and 3.1 $lb/10^3gal$ of PM.[166] EPA must explain why the boilers on the Discoverer will not have BACT limits at least as stringent as the average emission rates established in AP-42.

8. VOC BACT analysis for vented sources.

EPA's Proposed Statement of Basis at Section 4.1 concludes that "... BACT must be determined for *each emission unit on the Discoverer* which emits NOx, PM, $PM_{2.5}$, PM_{10}, SO_2, *VOC* and CO while the drillship is operating as an OCS source." [emphasis added]. EPA's Statement of Basis at Section 4.6 examines VOC BACT for vented sources of VOC (e.g. mud degassing).

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[164] EPA Chukchi Stmt of Basis at 65; EPA draft OCS PSD Proposed Permit for Shell Chukchi Operations at Condition J.2.

[165] AP-42 emission factors are given a rating of "A" through "E" with "A" indicating a high level of confidence in the factor ("A" = Excellent. Factor is developed from A- and B-rated source test data taken from many randomly chosen facilities in the industry population. The source category population is sufficiently specific to minimize variability. Tests are performed by a sound methodology and are reported in enough detail for adequate validation).

[166] Proposed Permit Conditions J.1.1 and J.1.3 list a NO_x BACT limit of 0.2 lb/mmBTU and a PM_{10} BACT limit of 0.0235 lb/mmBTU, respectively. Based on the diesel fuel heating value in Shell's engineering calculations (Appendix A of EPA's Statement of Basis) of 0.1331 mmBTU/gal:

$$0.2\ lb/mmBTU * 0.1331\ mmBTU/gal * 1000\ gal/10^3gal = 26.6\ lb/10^3gal\ NO_x$$

$$0.0235\ lb/mmBTU * 0.1331\ mmBTU/gal * 1000\ gal/10^3gal = 3.1\ lb/10^3gal\ PM_{10}$$

Mud degassing emissions can substantially contribute to VOC and greenhouse gas (GHG) emissions. Mud degassing systems are used to remove entrained formation gas from the mud to maintain higher mud density for well control. Drilling mud degassing units extract entrained gas from the mud at the surface and vent this gas directly into the atmosphere. Shell proposes to vent this gas directly to atmosphere through a 10" vent pipe. Shell concludes that it is not affordable to install a 2" flare nozzle atop the 10" mud degassing vent line to control the emissions, because the flare would cost $61,800. Shell estimates *only 128 lbs* of VOC are vented during the entire *drilling season*[167] resulting in an emission control cost of $965, 625 per ton. Based on Shell's very low emission estimate, EPA agreed no control would be required. Shell's extremely low emission estimate is not only inconsistent with MMS and industry emission factors, but is inconsistent with the need for a 10" vent pipe. Why would a 10" vent pipe be needed for such an extremely low flow rate? Clearly, Shell's engineers recognize the Potential To Emit (PTE) is substantially higher.

We reviewed EPA's record on this BACT assessment in detail, and did not find any review of the published MMS emission factor for offshore drilling mud degassing systems that NSB identified and requested EPA to review in our last set of comments (on the Chukchi permit). As we previously explained, in 2007, MMS hired a consulting firm to develop offshore drilling mud degassing emission factors, among other emission factors, to improve offshore oil and gas emission estimates.[168] MMS's drilling mud degassing emission factors have been reviewed and accepted by both API[169] and The Climate Registry.[170] The standard total hydrocarbon (THC) emission factor for water-based mud from an offshore drilling mud system is *881.84 lb* THC/drilling day. The standard methane (CH_4) emission factor from an offshore drilling mud system is 0.2605 tons of CH_4 per drilling day.

Again, we request that EPA require Shell to revise its mud degassing emission computations using standard emission factors developed by MMS, accepted by the American Petroleum Institute and The Climate Registry. Shell's computations use a non-standard approach. Shell's emission estimate severely underestimates the GHG emission impact[171] and VOC emission contribution.

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[167] EPA Stmt of Basis, at Section 3.4.12, Drilling Mud System (FD-32).

[168] Wilson, Darcy, Richard Billings, Regi Oommen, and Roger Chang, Eastern Research Group, Inc. *Year 2005 Gulfwide Emission Inventory Study*, U.S. Department of the Interior, Minerals Management Services, Gulf of Mexico OCS Region, New Orleans, December 2007, Section 5.2.10 (available at: http://www.gomr.mms.gov/PI/PDFImages/ESPIS/4/4276.pdf) (Attachment 19).

[169] American Petroleum Institute (API), Compendium of Greenhouse Gas Emission Methodologies for the Oil and Natural Gas Industry, August 2009 (Available at: http://www.api.org/ehs/climate/new/upload/2009_GHG_COMPENDIUM.pdf).

[170] The Climate Registry Oil and Gas Production Protocol, Draft for Public Comment, May 2009 (available at: http://www.theclimateregistry.org/downloads/2009/05/Oil-and-Gas-Production-Protocol.pdf).

[171] NOTE: Methane is of particular concern as a greenhouse gas since it is over 20 times more effective at trapping heat in the atmosphere than carbon dioxide over the same 100-year period.

If the MMS emission factor of 881.84 lb /drilling day is used over the 168 day drilling period (74 tons) the flare is cost effective at $834 per ton. Additionally the VOC estimate needs to be revised upward to reflect this higher number as well. We also request that EPA require Shell to calculate HAP emissions based on the substantially higher, revised VOC emission estimate.

If EPA has concerns about the quality of MMS's emission estimate, please explain what those concerns are, and provide an alternative emission factor that is more accurate. Or require Shell to test the vent to verify actual emissions.

B. A Proper BACT Analysis Must Include the Ancillary Vessels.

As described above, under NSB's proposed Option 3 additional vessels would be considered part of the OCS source subject to regulation by EPA. We ask that Shell and EPA utilize the top-down approach for applying BACT to these vessels.

In doing so, the fact that equipment (including vessels) are leased by Shell cannot serve as adequate grounds for concluding that applying emissions controls would be economically infeasible. Both the CAA and EPA's regulations apply to "owners *or operators*,"[172] as well as "any equipment, activity, or facility."[173] Thus, it is not enough that the equipment is not owned by Shell since Shell is the operator. At the very least, Shell and EPA must disclose the costs to Shell of owning such equipment versus the costs of leasing it, what the savings are, and in light of all those figures whether it is economical to apply control technologies.

Just as in the draft permit for the Chukchi operations, EPA has failed to apply BACT to the Discoverer's propulsion engine and several of the support vessels, including Icebreaker #2. We applaud EPA for taking steps to require additional pollution control that will further reduce emissions. But these increased control requirements still do not reflect EPA and Shell's legal obligations under the CAA to apply BACT analysis to all of the vessels that operate within 25 miles of the OCS source. Thus, EPA must apply BACT to all of Shell's sources, including all ancillary vessels.

EPA has determined that Icebreaker #2 is not "physically attached" to the Discoverer during the anchoring process, despite the fact that the two vessels are physically connected with an anchor line.[174] To reach this conclusion, EPA relied on the common meaning of "attached" but ignored common sense in applying the definition to the facts. EPA cites *The American Heritage Dictionary of the English Language*, 4th ed., (2006) for the definition of "attached" which is "to fasten, secure or join" or "to connect as an adjunct or associated condition or part."[175] EPA claims that the anchor line running between the vessels was not designed "to fasten . . . " or "to connect . . . " within the plain meaning. Regardless of the anchor line's design or intent, the anchor line in fact physically connects the vessels during the anchoring process. Because the vessels are physically connected, Icebreaker #2 falls within the plain meaning of "attached" and thus within the meaning of OCS source. Consequently, EPA must regulate Icebreaker #2 as an OCS source.

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[172] 42 U.S.C. § 7475 (emphasis added); 40 C.F.R. §§ 52.21(n), (o).

[173] 42 U.S.C. § 7627(4)(C); 40 C.F.R. § 55.2.

[174] EPA Re-Proposed Stmt. of Basis at 24, FN 8.

VII. Specific Comments on Permit Conditions, Compliance Demonstration, Monitoring and Reporting Measures.

A. Source Testing.

We strongly support EPA's requirements to verify that emission limits can be met by stack testing each emission unit.[176] Stack test data are critical to verify if permit limits can be met. While the stack testing requirements in the proposed permit are not as comprehensive as the original proposed permit requirements for Shell's Chukchi Sea PSD permit, the requirements are a substantial improvement over Shell's 2007 permit and we applaud EPA's more stringent emission verification approach.

We do not agree, however, that the reduced stack testing requirements be based on an operating range representing the most frequently-used loads. Rather, if EPA proceeds with less frequent testing for certain engines we strongly urge EPA to ensure that established load ranges will reflect maximum emissions scenarios. This is especially important for source testing of $PM_{2.5}$ emissions since compliance is demonstrated on a short-term averaging time.

Shell's September 17, 2009 comments to EPA on the proposed Chukchi permit at p.9, request that EPA *remove* the stack test requirements for the: MLC Compressor Engines, HPU Engines, Cranes, Cementing and Logging Units, the Boilers and Utility Generators. Shell proposed that EPA rely on generic, average emission factors for these units, without any stack testing. We fully support EPA's decision to keep these critical stack testing requirements for Shell's operations in the Chukchi and Beaufort Seas. We urge EPA to maintain the original, more comprehensive, testing requirements for a broader range of loads, as proposed in the original Chukchi permit, but support testing over a fewer number of load ratings over elimination of testing all together. We would like for EPA to assure that, if fewer tests are required, they be performed at loads that are most likely to result in maximum emissions, especially for source testing of $PM_{2.5}$ emissions.

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[175] *Id.*

[176] *See* Proposed Permit Conditions: C.6 (Generator Engines), F.6 (MLC Compressor Engines), G.8 (HPU Engines), H.7 (Deck Cranes), I.7 (Cement Unit and Logging Winch), J.5 (Boilers), K.9 (Incinerator), L.4 (Supply Ship), O.10 (Icebreaker #1), P.12 (Icebreaker #2), and R.7 (Oil Spill Response Fleet).

We do not agree with Shell's assertion that the impacts of these particular engines are small.[177] The HPU engines, in particular, contribute almost one-quarter of the impact to maximum $PM_{2.5}$ concentrations and 30% of the impact to maximum NO_2 concentrations. This is the second largest contributor to both $PM_{2.5}$ and NO_2 impacts of all sources. The cementing units contribute over one-third of the impact to maximum NO_2 concentrations and the deck cranes contribute one-fifth of the impact. All told, these engines, combined, make up over 40% of the impact to maximum concentrations of $PM_{2.5}$ and over 85% of the impact to maximum concentrations of NO_2.[178] Given that Shell's exploration activities in the Beaufort Sea are projected to consume over 75% of the available PSD Class II increment for NO_2, close to 70% of the 24-hour PM_{10} Class II increment and 83% of the 24-hour $PM_{2.5}$ NAAQS it is critical that the largest contributors to these pollutant concentrations be required to verify that they can meet permit limits using stack testing – specifically, the main drill rig engines, HPU engines, cementing units and boilers for PM_{10} and $PM_{2.5}$ and the HPU units, cementing units and deck cranes for NO_X.

Shell describes testing for these units to be "difficult, expensive and time-consuming" but nothing in their supplemental materials describes a situation that is impossible, even for the deck crane units.[179] Considerations of cost and convenience are not sufficient to preclude source testing of these engines. In fact, most of Shell's difficulties arise from testing during operation when, in fact, testing prior to operation is critical so that any needed modifications can be made to remedy failed tests. We support testing for all of these engines, including deck cranes, prior to operation and at loads reflective of maximum emission scenarios.

We also do not support the removal of stack testing requirements for the icebreakers.
In particular, we think it's critical to include stack testing at 20% load for Icebreaker #1 unless EPA will be adding a permit requirement limiting operation time of Icebreaker #1 at 20% load. Icebreaker #2 is still required to perform source testing at four loads, including 20% load, and we see no reason why Icebreaker #1 should not be subject to the same testing requirements (see Permit Condition P.12.1). In fact, Shell indicates in its supplemental materials for the Chukchi permit that a 20% load often results in higher emission factors.[180] Without more assurance that Shell does not operate its icebreakers at these lower loads EPA must assume the icebreakers could, in fact, operate at these loads and must include permit conditions to test at these higher emission rate levels.

The proposed permit requires stack testing to be completed prior to each drilling season, but does not specify how far in advance the testing must be done, nor does the permit include a remedy for failed tests. Proposed Permit condition B.20.9 requires all stack test results to be provided to EPA within 45 days of testing. But if stack testing only occurs a few days prior to the drilling season, there will not be adequate time to analyze and remedy any test results that exceed the permit limits before drilling starts. With a 168 operating day limit per drilling season, a quarter of the drilling season could pass before EPA even receives the test results.

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[177] November 23, 2009 letter from Shell to EPA Re Shell Preconstruction PSD Permit Application, Chukchi Sea, Alaska - Supplemental Application Support Materials in Response to November 17, 2009 Coordination and Consultation Meeting with Region 10

[178] September 19, 2009 letter from Shell to EPA Re Shell Gulf of Mexico Inc. comments on the August 2009 Proposed Discoverer / Chukchi OCS/PSD Permit to Construct, Table 7-4.

[179] *Id.* 191 at 10.

[180] *Id.* 192 at 9.

We request that EPA require all stack tests to be completed at least 180 days prior to each drilling season to ensure there is adequate time to analyze and remedy any test results that exceed permit limits. The permit must clearly state that any emission unit that fails to meet the permitted emission limit must not be operated until the unit is repaired or additional emission control is installed. Collecting test data, and merely reporting excess emissions if tests fail to meet permit limits, is not an acceptable solution, especially in the cases where the annual NO_x and 24-hour $PM_{2.5}$ compliance margins are very tight. A failed test, unresolved, could result in a NAAQS or increment exceedance. This is a very important point that was raised in our comments on the Chukchi permit; yet, EPA continues to not allow adequate time between testing and commencement of operations to address potential problems.

EPA's proposed permit included several conditions where one unit is tested to represent the emission performance of other like units (e.g. Condition C.6 that requires two of the Discoverer generator engines to be tested in the first year to represent the emissions of all six engines). In these cases, the permit must clearly state that if the representative unit fails the stack test, all like emission units correspondingly are assumed to have failed. All like units must be repaired or additional emission controls must be installed to meet the limit. Alternatively, additional stack tests on the remaining units could be performed to verify individual unit compliance to isolate the problem unit(s). We recommend that EPA evaluate information on the unit year, model type and historical use to demonstrate that the equipment is of like equipment specification and has a similar operating history. EPA must demonstrate that the units are representative, or it must require each unit to be tested individually before the first drilling season.

EPA does not require source tests for the Discoverer's main propulsion engines. We question whether the main propulsion engines would actually be completely shutdown when the Discoverer is operating as an OCS source.[181] If, under further examination, EPA determines the propulsion units will be operated under the Option selected by EPA for the OCS definition, source testing should be required.

1. Load factors, testing and monitoring.

Shell's application includes a number of assumed operating loads. Emissions are a function of load. EPA's proposed permit accepts these assumed loads and requires stack testing within the expected operating range (see, e.g., Conditions C.6.2, F.6.2, G.8.2, etc.). The proposed permit ensures that calculated emission rates used for compliance demonstration are based on the maximum emissions scenario for the range of loads tested, except for the boilers on the Discoverer. We request EPA revise the following permit condition to be more explicit regarding this point for the boilers. We request permit condition J.5.4 read:

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[181] *See, supra* at 12-15.

> *For each boiler,* ***each load factor*** *and each pollutant, the permittee shall determine emission factors in the following units: lbs/MMBtu and lbs/gallon.*

Condition J.6.5 then requires the use of the highest emission factor calculated in the corresponding section (revised above) and will ensure all loads are considered when making this calculation of highest emissions.

We request that EPA include a recordkeeping requirement to track the operating loads during the first drilling season to verify actual operating load ranges. The permit should also include requirements for additional stack testing if actual operating practices include operating loads outside the currently assumed ranges.

B. Fuel and Electrical Output Monitoring.

We strongly support the compliance demonstration requirements for fuel monitoring in the proposed permit for the MLC compressor engines (FD 9-11), HPU engines (FD 12-13), deck cranes (FD 14-15), Cementing Units and Logging Winches (FD 16-20), Heat Boilers on the Discoverer (FD 21-22) and on the Icebreakers and for the Oil Spill Response fleet propulsion and non-propulsion engines (FD-N 1-4). We also support the requirement that fuel flow meters measure the fuel flow rate with an accuracy equal to or better (less) than two percent of the meter's upper range value (see, e.g., Condition F.7.1.3).

Since the emissions inputs for the modeling analysis are based, in general, on multiplying the applicable emission factor by the associated operating factor (e.g., fuel usage rate) then the accuracy of this input is determined by the sum, in quadrature, of the fractional uncertainties associated with each factor.[182] If, as is indicated in Shell's September 17, 2009 comments (p. 11) on the its Chukchi permit, the uncertainty in the stack test data is upwards of 15%, then Shell must be able to demonstrate compliance with the NAAQS considering a margin of error no less than 15%.[183] This would mean the predicted 24-hour $PM_{2.5}$ concentration would need to be less than 29.8 $\mu g/m^3$ when considering the applicable background concentration. In fact, the highest predicted 24-hour $PM_{2.5}$ concentration from the permit modeling was 29.2 $\mu g/m^3$ with a background concentration of 10 $\mu g/m^3$.[184] EPA must establish permit limits that, when considering the accuracy of

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[182] The quadrature sum is the square root of the sum of the squares.

[183] The uncertainty in the calculated emission rate would be the square root of the sum of the squares of the fractional uncertainties, as follows:

$$q = ((2\%)^2 + (15\%)^2)^{1/2} = 15.1\%$$

[184] EPA Stmt of Basis, Table 5-14.

the emission factor and operating data, demonstrate compliance with the NAAQS with a margin of error no less than the accuracy of the input data.[185]

EPA's proposed permit allows load monitoring to replace fuel monitoring for the Discoverer generator engines (FD 1-6) and for the internal combustion engines on its support icebreakers. Shell states load monitoring systems are already installed on these vessels, and are more accurate than fuel monitoring systems. While Shell has installed load monitoring capability on the currently contracted vessels, it has requested flexibility in Icebreaker #1 selection for future operating years, and, must explain how it will provide equivalent capability on future contract vessels.

The use of load monitors in place of fuel monitors means compliance assurance also rests on the accuracy of the assumed generator efficiency. Shell's supplemental materials claim that "typical generators convert over 90% of the energy coming from the engine into electrical load" and, further, that "any error in the assumed efficiency is likely to be on the order of 1-2%."[186] Shell then provided five examples of generator efficiencies that reflect engine generator sets of the same sizes as those proposed for the Shell project and that ranged from 92%-96%. EPA based its electrical power output limits for these units on an assumed efficiency of 92%. EPA justified the use of the low end of the efficiency range due to "the apparent age of the Discoverer's gensets and the lack of specific information regarding the efficiencies of the Discoverer's gensets."[187] Because of this and because the specifics of Icebreaker #1, in particular, are unspecified, we believe that an assumed generator efficiency of 90% would be more prudent. Without more specifics on the actual gensets used and because compliance with the $PM_{2.5}$ NAAQS is just barely demonstrated when considering the accuracy of the input data, EPA must consider the most conservative approach to ensuring compliance. Alternatively, EPA could require a minimum generator efficiency (based on technical data for the actual gensets used) of 92% and include a corresponding permit condition and compliance demonstration requirements to ensure this minimum efficiency.

C. Relief well emissions.

EPA's proposed permit condition B.2.3 requires Shell to include any time spent drilling a relief well in the total 168 day operating period. We agree that the time needed to drill a relief well should be deducted from the total 168 day operating period. We also agree that relief well drilling emissions must be included in PTE calculation.

Shell does not specify the time it will take to drill a relief well in the air permit application, but does conclude in its Beaufort Sea Oil Discharge Prevention and

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[185] As determined by the sum, in quadrature, of the fractional uncertainties for each variable.

[186] November 23, 2009 letter from Shell to EPA Re Shell Preconstruction PSD Permit Application, Chukchi Sea, Alaska - Supplemental Application Support Materials in Response to November 17, 2009 Coordination and Consultation Meeting with Region 10, p. 7 of 18.

[187] EPA Stmt of Basis at 46.

Contingency Plan (ODPCP) that a blowout can be controlled using the M/V Discoverer within a 34 day period.[188]

We request that EPA revise permit Condition B.2.3 to read:

> *A 34 day period* ***must be reserved*** *out of the total 168 operating period to drill a relief well. All exploratory well drilling (planned wells and sidetracks) must be completed within 134 days, reserving at least a 34 day period to drill a relief well. Any time spent drilling a relief well shall be included in the time recorded in Conditions B.2.2.3 and B.2.2.4. If the relief well exceeds a 34 day period, excess emissions must be reported.*

If that time is not reserved, and a relief well is drilled increasing the drilling days beyond 168 days (+34 days), an air quality violation is likely to occur.

D. Sulfur content of diesel fuel.

We commend Shell's actions to commit to the use of Ultra Low Sulfur Diesel Fuel (ULSD) for its OCS exploration activities in the Beaufort and Chukchi Seas north of the Bering Strait. The huge reductions in anticipated sulfur dioxide emissions that will result from this commitment is significant and will reduce not only localized emissions of SO_2 but will reduce $PM_{2.5}$ pollution from the project, as well. Specifically, on December 9, 2009 EPA received notice of the following:

> "Shell hereby commits to using only ultra-low-sulfur diesel (15 ppm) in any engine on the Discoverer (including its propulsion engines) and in any engine on any vessel in the associated fleet when operating North of the Bering Strait."[189]

EPA's proposed permit, however, does not include a requirement to use ULSD fuel in the propulsion engines of the Discoverer, as committed to by Shell.

EPA's proposed permit condition B.4 requires ultra-low sulfur fuel (15 ppm sulfur) on all emission units *except* the main propulsion engines (Unit FD-7). We request that the main propulsion engines be required to use ultra-low sulfur fuel (15 ppm sulfur) in accordance with Shell's December 9, 2009 commitment and with EPA's June 6, 2006 Final Rule: Control of Air Pollution from Motor Vehicles and Nonroad Diesel Engines: Alternative Low-Sulfur Diesel Fuel Transition Program for Alaska.[190]

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[188] Shell Chukchi Sea ODPCP at 1-23, 4-7 (available at:

http://www.mms.gov/alaska/ref/ProjectHistory/2009_Chukchi_Shell/2009_0623_Shell_cplan.pdf) (Attachment 13).

[189] December 9, 2009 letter from Shell to EPA Re Shell Gulf of Mexico Inc. Supplement to Application for Discoverer/Chukchi OCS/PSD Permit

[190] 71 Fed. Reg. 32450-32464 (June 6, 2006).

EPA's proposed permit condition B.4 requires testing to verify the ultra-low sulfur fuel (15 ppm sulfur) limit is met; however, EPA's proposed permit condition B.4.3 appears to allow Shell to burn fuel that exceeds the 15 ppm limit as long as any exceedance is reported to EPA. We request that proposed permit condition B.4.3 be revised to clarify that fuel that does not meet the 15 ppm standard cannot be used, and must be returned to the supplier. We do not find it acceptable to merely test the fuel sulfur content, and report any exceedances as a BACT approach. We request that EPA enforce its requirement to limit all actual fuel use to 15 ppm sulfur. Fuel that does not meet that standard should be returned to the supplier.

Condition B.4 should be revised to read:

> *The permittee shall not combust any liquid fuel with sulfur content greater than 0.0015 percent by weight, as determined by Condition B.4.1, in any emission unit on the Discoverer (including its propulsion engines).*

Conditions B.4.3 and B.5.3 should be revised to read:

> *Fuel tests must verify the fuel sulfur content is 15ppm or less for that fuel to be used. Fuel exceeding 15ppm fuel sulfur must be returned to the supplier, unused.*

EPA's June 6, 2006 Final Rule: "Control of Air Pollution from Motor Vehicles and Nonroad Diesel Engines: Alternative Low-Sulfur Diesel Fuel Transition Program for Alaska"[191] requires marine vessels to comply with a 15 ppm fuel sulfur standard on June 1, 2010. Shell's proposed 2010 operations, therefore, need to comply with this standard.[192] The final rule states:

> Beginning June 1, 2010, diesel fuel used in these applications must meet a 15 ppm (maximum) sulfur content standard.
>
> In 2010, highway and nonroad fuel in rural Alaska will be required to meet the 15 ppm sulfur standard, providing the full environmental benefits of these programs to rural Alaska as well.
>
> The permanent exemption from the 500 ppm sulfur standard of 40 CFR 80.29 for rural Alaska terminates on the implementation date of the new 15 ppm sulfur standard in 2006.
>
> On September 14, 2003, Alaska ... requested that the ***15 ppm standard*** applicable to locomotive and ***marine diesel fuel produced in, imported into, and distributed or used within rural Alaska be moved up to June 2010,*** from the June 2012 date in the final nationwide NRLM rule.

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[191] 71 Fed. Reg. 32450-32464 (June 6, 2006).

[192] EPA, Regulatory Announcement http://www.epa.gov/otaq/regs/fuels/diesel/420f06040.htm (Attachment 20).

> This rule specifies one exception to the nationwide NRLM standards and implementation deadlines in effect for diesel fuel produced in, imported into, and distributed or used within rural Alaska, beginning June 1, 2010. ***This exception is that*** locomotive and ***marine diesel fuel will also be required to meet the 15 ppm sulfur content standard on June 1, 2010*** rather than in 2012.
>
> This rule further specifies that the 15 ppm sulfur standard applicable to locomotive and marine fuel (LM) be moved forward to 2010 to be implemented at the same time as the 15 ppm sulfur standard for nonroad (NR) diesel fuel. In this way there will only be one grade of NRLM[193] diesel fuel in the rural areas in 2010 and 2011 instead of two separate grades (i.e. 15 ppm and 500 ppm). The implementation dates for the NRLM diesel fuel sulfur standards are shown in Table II.B-1. [Table II.B-1 shows refiners and importers of fuel must meet the 15 ppm fuel sulfur standard on June 1, 2010.][194]

E. Bow Washing, Anchor Setting and Retrieving and Resupply Requirements for the Icebreaker Vessels

EPA's proposed permit includes requirements for bow washing for Icebreaker #2 in Permit Condition P.9. Specifically, the permit requires Shell to record the date, hour and minute that Icebreaker #2 begins and ends its bow washing operations. The permit should limit the bow washing operations to an hour since this was the basis for the modeling analysis and EPA makes it clear in the Statement of Basis that this is a maximum timeframe needed for bow washing activities.[195] Similarly, EPA must also include a permit requirement limiting the total travel and idle time during icebreaker #1 resupply to two hours and during anchor handler (icebreaker #2) resupply to one hour.[196]

During anchor setting and retrieval, EPA states that "[d]rilling is not expected to occur during this process, so several of the Discoverer's emission sources are not modeled, and the anchor handler's main engines are assumed to be at 20% load." If EPA is basing its modeling demonstration on certain Discoverer emission sources not operating during anchor handling and retrieval and is assuming the icebreaker #2's main engines are operating at 20% load then EPA must include enforceable permit conditions prohibiting operation of those sources and limiting operating loads to ensure that what was modeled represents actual operations.

F. Tanker Requirements

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[193] Nonroad, Locomotive and Marine (NRLM).

[194] 71 Fed. Reg. 32450-32464 (June 6, 2006) (emphasis added).

[195] EPA Stmt of Basis at 58.

[196] EPA Stmt of Basis at 118.

EPA's proposed permit does not include any specific requirements for the tanker that will accompany the drilling fleet. According to the Statement of Basis, "[a] tanker is expected to accompany the drilling fleet at the distance of at least 25 miles from the Discoverer. It will not be approached the Discoverer. The tanker will be either the *Affinity* of a similar vessel. The 228-meter *Affinity* uses Distillate Marine C oil, similar to No. 4 oil."[197] EPA completed a modeling analysis of the tanker's impacts based on the above assumptions for the vessel. EPA must include a provision in the permit prohibiting the tanker from operating within 25 miles of the Discoverer and must also specify the *Affinity* or a vessel that would have a similar impact to the *Affinity* and fuel requirements for the vessel that would ensure compliance with all NAAQS and increment standards.

G. COA Regulation for Ice Fog Standards

EPA must address the Corresponding Onshore Area ice fog standards in 18 AAC 50.080 and in Appendix A of 50 CFR 55. All fuel-burning and incinerator emission units on the Discoverer and the associated support fleet in an area of potential ice fog must be required to obtain a permit and reduce water emissions. EPA must include an analysis of this COA regulation as it applies in the Inner OCS and include the needed permit conditions in the final permit.

H. Prohibited activities.

Proposed Permit condition B.21 prohibits flowing test wells, flaring gas and storing liquid hydrocarbons. This condition should also prohibit venting formation gas unless those emissions are accounted for in the permit and BACT is applied. EPA must clearly prohibit gas venting or properly account for it.

I. EPA's proposed OCS/PSD permit must include requirements to make enforceable Shell's statements regarding the exploratory drilling program that were made in its permit application.

EPA's proposed permit for Shell's exploration activities in the Beaufort Sea includes important provisions to ensure that the permitted sources cannot be modified from the source parameters that were reflected in Shell's complete PSD permit application. EPA's proposed permit specifies the date of the PSD permit application, descriptions of the proposed sources that include the individual make and model, as well as the rated capacity. We strongly support the inclusion of these provisions and references to the representations made in the permit application in order to ensure that Shell cannot change its operation in ways that could change air pollutant dispersion or alter BACT analyses without limitation. As an added measure, we suggest that EPA include a provision in the permit stating that operation of the permitted sources must be in accord with the information provided in the PSD permit application submitted by Shell Offshore Inc. on January 18, 2010 and supplemented with the specific submittals identified in the official administrative record for the proposed permit action.

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[197] EPA Stmt of Basis at 122.

EPA must make it clear in the permit that if the required source tests show Shell's emission estimates are not in accordance with permit limits then the appropriate emission control must be installed ***prior to the next season***. EPA would also, then, need to revise the ambient air modeling to ensure NAAQS and increment compliance.

Further, EPA must require notification of any deviations from the information included in the permit application materials, and must make clear that any significant deviation from the representations made by Shell in its PSD permit application may be grounds for suspension or revocation of the permit. These types of permit provisions are commonly required in PSD permits, and provide a necessary assurance to the public and tribal, state and federal regulatory agencies that operation of significantly different sources, or significant modifications of the proposed sources, cannot occur without further evaluation.

VIII. Comments on the Ambient Air Quality Analysis and Supporting Data.

A. Ice management and anchor handling fleet.

EPA's proposed permit specifies the Tor Viking or Hull 247 as the anchor handler (Icebreaker #2) but allows for the use of a generic ice management vessel (Icebreaker #1). Under the proposed permit conditions, Shell can use generic parameters for capacity (see, e.g., Conditions O.1.1 through O.1.4), emission rates (Conditions O.1.5 and O.1.6) and limits for volume source release heights (e.g., Condition O.9). We are not convinced that merely capping the capacities of various vessel parameters, requiring the vessels meet certain emission rates for $PM_{2.5}$, PM_{10} and NO_x and requiring a minimum volume source release height is enough to ensure that the use of different vessels will be able to ensure compliance with NAAQS. We continue to prefer that EPA require specific Ice Management vessels and establish permit limits and associated modeling requirements based on the use of those specific vessels. We strongly support the specific permit limits and modeling for the anchor handler (Icebreaker #2).

We support EPA's position that specific permit limits and associate compliance demonstration requirements are needed for the anchor handler in order to ensure that the vessel's emissions are, in fact, properly represented by AP-42 emission factors. This is particularly important given that there are no stack test data available for PM emissions from these, or similar, engines.[198] If EPA will be allowing the use of the much-lower AP-42 emission factors for the anchor handler then it must include associated emission limits in the final permit.

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[198] See November 23, 2009 Shell Preconstruction Permit Application for Frontier Discoverer Drillship in Chukchi Sea, Alaska, beyond the 25-mile Alaska Seaward Boundary: Supplemental Application Support Materials Responding to R10 Pat Nair's Email and Discussion on November 17, 2009 in Seattle, Washington, p. 3 of 18.

The proposed permit requires stack testing of the support vessels to be completed prior to each drilling season (*see, e.g.*, Conditions O.10 and P.12), but does not specify how far in advance the testing must be done, nor does the permit include a remedy for failed tests.

Permit condition B.20.9 requires all stack test results to be provided to EPA within 45 days of testing. However, if stack testing only occurs a few days prior to the drilling season, there will not be adequate time to analyze and remedy any test results that exceed the permit limits before drilling starts. With a 168 operating day limit per drilling season, a quarter of the drilling season could pass before EPA even receives the test results. Permit conditions O.1.7 and P.1.7 require Shell to notify EPA no later than 45 days prior to deployment to the Beaufort Sea of the ice management vessels selected. EPA requires 30 days notice on the testing which would appear to result in testing occurring as little as 15 days before the start of the drilling season. EPA must coordinate these timetables so that adequate time is allowed for to remedy any failed tests of the specified vessels

We request that EPA require all stack tests to be completed at least 180 days prior to each drilling season to ensure there is adequate time to analyze and remedy any test results that exceed permit limits. The permit must clearly state that any emission unit that fails to meet the permitted emission limit must not be operated until the unit is repaired or additional emission control is installed. Collecting test data, and merely reporting excess emissions if tests fail to meet permit limits, is not an acceptable solution, especially in the cases where the annual NO_x increment and 24-hour $PM_{2.5}$ NAAQS compliance margins are tight. A failed test, unresolved, could result in an air quality standard exceedance. EPA did not respond to this concern in the Chukchi permit, nor even evaluate optimized source test timing with Shell.

We remain concerned that ice management activities may be underestimated in the proposed permit analysis. EPA has not specifically addressed this concern in the Camden Bay permit. This is important since the icebreaker activities represent a large portion of the overall emissions from the exploration activities. Specifically, the ice management vessels' activity accounts for more than three quarters of the total annual $PM_{2.5}$ emissions (and over two thirds of the total annual NO_x emissions) from Shell's exploration drilling activities in the Beaufort Sea.[199] The ice management vessels' emissions are dependent on ice conditions; heavier ice conditions result in heavier engine load factors and higher emissions. The Proposed Statement of Basis (p. 54) indicates that, "[b]ased on statistics on ice at the Sivulliq drill site in the Beaufort Sea, Shell estimates that ice breaking capability in its lease holdings in Lease Area lease sales 195 (March 2005) and 202 (April 2007) in the Beaufort Sea would only be required 38 percent of the time."

Assuming this is the same data used for the Exploration Plan, this estimate is based on 2003-2005 data.[200] The reference for this statement is a recent (2009) conversation between Air Sciences, Inc. and the "Arctic Wells Advisor" for Shell International

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[199] Shell Outer Continental Shelf Pre-Construction Air Permit Application Frontier *Discoverer* Beaufort Sea Exploration Drilling Program, January 2010, Table 2-2, p. 15.

[200] Shell Beaufort Sea EP EIA Appendix H at 206

Exploration and Production, Inc. Based on these data and this reference, it was assumed that there would be a 38% frequency of ice within 30 miles of the drillship. However, in its revised application to the US Coast Guard for safety zone designation, Shell characterized the ice conditions more recently than 2003-2005 as follows:

> Ice conditions during 2006 were such that the areas of drilling interest were ice covered the majority of the period between July and October. If ice conditions are similar during 2007, then each drill rig will be constantly ice managed within its anchor array.[201]

This indicates that there is a strong possibility that the 38% frequency of ice may grossly underestimate emissions from the icebreaker vessels. EPA must secure an unbiased source of data for this important assumption – something other than an estimate from Shell of ice conditions. If the operator's estimate is based on a scientific analysis of ice flow data from 2003-2005 then that analysis should be made available and more recent data, if possible, should be incorporated into the analysis. The icebreaker vessels' emissions must be modeled to account for the maximum potential operation scenario under maximum ice conditions for the relevant time of year.

B. Oil spill response.

EPA does not address the potential air impacts from sources associated with potential oil spills in this permit. There are emissions estimates for oil spill response vessels in the inventory to account for emissions from these vessels associated with training and drills but EPA does not directly address the potential ambient air quality impacts from the pollutants that will occur in the event of an oil spill. The details of an oil spill response and ensuing emissions are known and therefore we ask that EPA consider these potential emissions along with Shell's potential to emit. EPA should complete a full evaluation of the potential air quality impacts from an oil spill scenario, including VOC and HAP emissions from evaporation, $PM_{2.5}$ and PM_{10} emissions from in-situ burning during cleanup operations and combustion emissions (NO_x and PM) from vessels during the response. Alternatively, EPA should clarify the applicability of USCG and ADEC guidelines and rules to Shell's operations (*e.g.*, related to spill scenarios for in-situ burning, etc.) and how these will ensure protection of human health in the event of an oil spill.

If EPA will not be addressing an emergency oil spill response event directly in this permit then it needs to address how attainment of the NAAQS will be assured for both the Inner OCS and Outer OCS baseline areas, in general. The CAA Section 110 requirements for States to prepare State Implementation Plans (SIPs) that detail provisions for attainment and maintenance of the NAAQS in the Air Quality Control Regions (AQCR) under its jurisdiction apply to the Inner OCS portion of the AQCR where Shell proposes to conduct its exploratory drilling program. EPA must clearly explain how it will be ensuring attainment of all NAAQS in the Outer OCS portion of the applicable AQCR in the absence of a SIP for this area. Specifically, EPA must address how the enforceable measures of a Federal Implementation Plan may be needed in order to establish contingency plans for air pollution emergencies, such as may occur during an oil spill.

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[201] Letter from Susan Childs, Regulatory Affairs Coordinator – Alaska, Shell Offshore Inc. to United States Coast Guard, District 17 at 2 (May 30, 2007), regarding the establishment of safety zones for the Frontier Discoverer drill ship and the semi-submersible drill unit Kulluk in the Beaufort Sea, Alaska.

C. Hazardous Air Pollutants (HAPS).

The proposed permit is based on total hazardous air pollutant emissions from the proposed exploration drilling program of 1.69 tons per year, as quantified in Shell's permit application materials. Shell's estimates are based on "requested limits and other limits assumed under the permit application and supporting materials submitted to EPA (Shell Beaufort Permit Application 01/18/10, Table 2-2)."[202]

The emissions calculations included in Shell's application materials show HAP estimates for units FD-1 through FD-23, the ice management fleet and the OSR fleet. There are no HAP emissions estimates for the fuel tanks (FD-24 through FD-30), the drilling mud system (FD-32) and the shallow gas diverter system (FD-33).[203] We are concerned that this application does not include comprehensive estimates for individual HAPs as well as an assessment of total HAP emissions from all sources combined. We reviewed all the work materials EPA provided supporting the proposed permit, and there is no indication that EPA completed a technical review of the HAPS inventory. EPA's inventory in Appendix A of the Statement of Basis includes only criteria air pollutants (i.e., no HAP emissions estimates). EPA relies on Shell's application estimate of 1.69 tons of HAPS, and as explained above, this number is underestimated because it uses non-standard industry and MMS venting factors. We request that EPA complete a thorough technical review of the HAPs inventory to ensure it has been properly computed, and as noted above, if EPA is concerned about the use of MMS venting factors, we recommend source testing to verify VOC/HAP emissions from these operations during the first season of operation to improve emission estimates.

D. Background concentrations

1. Use of Maximum Monitored Concentrations as Representative of Background Concentrations

EPA and Shell are relying on data collected at several different monitoring stations across the North Slope as representative of background concentrations for the Shell exploratory drilling program in the Beaufort Sea. Table 5-10 of the Statement of Basis summarizes maximum measured concentrations of PM_{10}, NO_2, CO and SO_2 at eight different monitoring sites. The background concentrations used in EPA's ambient impact analysis, as reported in Table 5-11 Background Estimates for NAAQS Analysis, do not reflect the maximum concentrations monitored and reported in Table 5-10. For example, EPA chose to use a 24-hour average PM_{10} background concentration of 55.1 $\mu g/m^3$ from the BPXA Prudhoe Bay monitor even though two other monitors listed in Table 5-10 measured higher concentrations – one of which measured a concentration two times higher (114 $\mu g/m^3$). EPA must explain why neither of these two higher concentrations were used as the representative background concentration for PM_{10}. Similarly, EPA used the annual NO_2 background concentration of 11.3 $\mu g/m^3$ concentration measured at the BPXA Liberty monitor even though two other monitors measured higher concentrations of NO_2 - one by as much as 75%. EPA must explain why it did not use the 19.7 $\mu g/m^3$ concentration measured at the BPXA Prudhoe Bay station as representative of annual NO_2 concentrations.

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[202] EPA Stmt of Basis at 30.

[203] *See* Shell Outer Continental Shelf Pre-Construction Air Permit Application Frontier *Discoverer* Beaufort Sea Exploration Drilling Program, January 2010, Table 2-2, p. 15.

We urge EPA to use the *highest* monitored concentration for each pollutant and for each averaging time (i.e., pollutant concentrations need not be from the same monitor for both short-term and long-term averaging times). The NAAQS were set to protect the public and the environment from the adverse effects from air pollution. Thus, in determining whether these air quality standards might be exceeded as a result of Shell's proposed exploration drilling program, EPA must use background concentrations that are truly representative of the maximum concentrations that are currently occurring. Only by using a background concentration that is representative of the maximum concentration for the area will EPA be achieving the most protective outcome. Using a concentration that is lower than monitored levels in the area leaves open the possibility that EPA's analysis could under-estimate the impacts on human health that will result from Shell's emissions on top of all other air emissions sources in the region. Using a lower background concentration than what has been observed elsewhere, nearby, in the area simply ignores the real fact that higher levels of background pollutant concentrations can occur. As an example, use of the maximum pollutant concentrations in Table 5-10 would result in 24-hour PM_{10} impacts at 90% of the NAAQS (instead of 50% of the NAAQS as presented in Table 5-14 of the Statement of Basis).

2. $PM_{2.5}$ Background Concentrations

We are very concerned with the limited amount of data used as the basis for the background $PM_{2.5}$ concentrations. The Badami station began collecting $PM_{2.5}$ data on August 20, 2009.[204] EPA is accepting data collected through December 15, 2009 from the Badami station in fulfillment of the preconstruction monitoring requirement of 40 CFR § 52.21(m). EPA justifies the use of these data as representative of background concentrations for Shell's exploratory drilling program in the proposed permit, as follows:

> The available $PM_{2.5}$ data from Badami covers a roughly four month period which is within Shell's 168-day drilling season between July 1 and December 31. We expect to receive $PM_{2.5}$ data from Badami for the period December 15 through December 31, 2009, during the public comment

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[204] EPA Stmt of Basis at 111.

> period for this permit, after which the data set is expected to meet the four-month requirement for acceptability under 40 C.F.R. 52.21(m)(1)(iv). $PM_{2.5}$ data from July 1 to August 15, 2009, is not available at Badami, so the data will not cover the entire drilling season. It is expected that local contributions of PM_{10} and $PM_{2.5}$ from blowing dust would be highest in the summer months, while contributions from local fuel-burning heating units would be higher in the fall and winter months. No information is available on the seasonality of any particulate matter transported from overseas. EPA expects that actual background levels of pollution several miles offshore in the vicinity of Shell's planned exploratory drilling operations are likely to be lower than the levels recorded onshore, where monitors are affected by local industrial and residential sources.[205]

EPA's regulations require at least one year of pre-construction monitoring data unless "the Administrator determines that a complete and adequate analysis can be accomplished with monitoring data gathered over a period shorter than one year (but not to be less than four months)."[206] It is questionable that even the bare-minimum requisite four months of $PM_{2.5}$ data have been obtained. Clearly EPA has based this proposed permit on a data set that does not meet the minimum requirements for pre-construction monitoring in 40 CFR 52.21. EPA has not reviewed a complete and validated four month record of data from the Badami site (EPA only has valid data from August 20 - December 15, which is not a complete four month period). On top of that, there are a full 14 days, or *two full weeks*, of invalid data in the August 15 - December 15, 2009 dataset. This includes eight consecutive days of invalid data collection in October 2009, which is the same month during which the maximum concentration was recorded. This seriously calls into question the completeness of this record.

We strongly believe Shell should be required to collect a full year worth of pre-construction monitoring data prior to beginning exploration activities. The fact that EPA's proposed (and re-proposed) permits for Shell's exploratory drilling programs in the Beaufort and Chukchi Seas both include requirements for post-construction monitoring of $PM_{2.5}$ (e.g., Condition S.1 of the proposed Beaufort Sea permit) undercuts the Agency's argument that sufficient pre-construction monitoring data exist. This same issue was raised to Shell as far back as 2007[207] when we requested additional site-specific monitoring data to be collected for their proposed exploratory drilling program; Shell has had adequate time to collect the data. There should be no short cuts for failing to collect an adequate amount of pre-construction monitoring data and Shell should be held to the same regulatory standards as all other applicants. Nevertheless, if EPA will be accepting less than twelve months worth of pre-construction monitoring data for $PM_{2.5}$, we urge EPA to consider the fact that the background concentrations are based on a much more limited data set than optimal and, therefore, must pursue conservative assumptions in defining background concentrations.

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[205] EPA Stmt of Basis at 111.

[206] 40 CFR § 52.21(m)(1)(iv).

[207] Letter from Johnny Aiken, North Slope Borough, to Natasha Greaves and Dan Meyer, EPA Region 10 (May 11, 2007) (Attachment 21).

Recall, for example, what has happened with the data set used for Shell's Chukchi Sea permit. With each subsequent data report from the Wainwright monitor, higher monitored concentrations of $PM_{2.5}$ were recorded. The original proposed permit for the Chukchi Sea used a background concentration of 8 μg/m^3. Shell then submitted monitoring data collected at the Wainwright monitoring station through July 31, 2009 to EPA (on September 17, 2009) which included higher recorded values than the previous record. Specifically, 24-hour average $PM_{2.5}$ concentrations collected in July included no less than eight days where the maximum recorded 24-hour average concentration was equal to or greater than the background concentration of 8 μg/m^3 used in EPA's and Shell's ambient air impact analysis. The highest 24-hour average concentration from July of 14 μg/m^3 was 75% higher than the background concentration used in the original proposed permit analysis. Use of any of the top three supplemental monitored concentrations as representative background concentrations in EPA's ambient air analysis would have resulted in modeled violations of the 24-hour $PM_{2.5}$ NAAQS.[208] Shell subsequently revised its operating scenarios and submitted new modeling to EPA demonstrating compliance with the NAAQS based on a background concentration of 14 μg/m^3. However, the 4th quarter monitoring report from Wainwright again showed higher 24-hour $PM_{2.5}$ concentrations – as high as 23 μg/m^3. In the end, EPA's re-proposed permit included a background concentration of 11 μg/m^3 based on several factors, including an adaptation of the monitored data set to subtract out days with high winds, no precipitation and non-stabilized surfaces (i.e., no snow cover) in order to better represent "offshore" concentrations. After a close look at the data set, we supported adapting the data set to account for the fact that windblown dust is not a factor in offshore concentrations. We strongly urged EPA, however, not to go any lower than its proposed background concentration of 11 μg/m^3 for offshore background concentrations of $PM_{2.5}$. We told EPA, specifically, that because at least one 24-hour average concentration of 11 μg/m^3 occurred on a day with no high-winds (see, e.g., Wainwright data collected on July 14, 2009) it was imperative that EPA use, at least, this maximum monitored value as representative of background concentrations offshore. We again reminded EPA that this is particularly important since we do not support the use of a pre-construction monitoring period less than a year.

EPA's proposed permit for Shell's exploration drilling in the Beaufort Sea uses a 24-hour average $PM_{2.5}$ background concentration of 10 μg/m^3. First of all, EPA must explain why this concentration is protective given the fact that it is using a higher concentration as representative of offshore background $PM_{2.5}$ concentrations for the Chukchi Sea permit. This does not appear to be the most prudent course considering the limited (and incomplete) data set available to date for the Beaufort Sea. EPA's compliance demonstration is already so incredibly tight that a change in the background concentration from 10 $\mu g/m^3$ to 11 $\mu g/m^3$ would mean that Shell would not be able to demonstrate compliance with the 24-hour $PM_{2.5}$ NAAQS considering a margin of error based on the accuracies of the input data. Specifically, we commented earlier that if, as indicated, the uncertainty in the stack test data is upwards of 15%, then Shell must be able to demonstrate compliance with the NAAQS considering a margin of error no less than 15%. This would mean the predicted 24-hour $PM_{2.5}$ concentration would need to be less than 29.8 $\mu g/m^3$ when considering the applicable background concentration. Using a background concentration of 11 $\mu g/m^3$ results in a 24-hour $PM_{2.5}$ concentration of 30.2 $\mu g/m^3$, which means that – given the uncertainty in the input data – Shell cannot reasonably demonstrate compliance with the 24-hour $PM_{2.5}$ NAAQS.

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[208] EPA Re-Proposed Stmt of Basis, Appendix B, Table 12a shows a max modeled 24-hour average concentration for $PM_{2.5}$ of 25.7 μg/m^3 (SOS #1). Considering the top three monitored concentrations at Wainwright, total predicted concentrations are as follows:

25.7 μg/m^3 + 14 μg/m^3 = 39.7 μg/m^3 (113% of 24-hour $PM_{2.5}$ NAAQS)

25.7 μg/m^3 + 13 μg/m^3 = 38.7 μg/m^3 (111% of 24-hour $PM_{2.5}$ NAAQS)

25.7 μg/m^3 + 11 μg/m^3 = 36.7 μg/m^3 (105% of 24-hour $PM_{2.5}$ NAAQS)

Given the limited and incomplete $PM_{2.5}$ data set that is the basis for EPA's compliance demonstration for the proposed permit, EPA must use the most conservative background concentration possible which, at a minimum, would be equal to the value used as representative of offshore sources for the Chukchi Sea permit. There is no reason why that value of 11 $\mu g/m^3$ would not be applicable in the Beaufort Sea as well. EPA must then revise emission limits, as needed, in order to demonstrate compliance with the 24-hour $PM_{2.5}$ NAAQS based on an appropriate margin of error that is based on the uncertainties in the emissions data.

Due to the limited data record for $PM_{2.5}$, we also strongly support the use of actual maximum monitored $PM_{2.5}$ concentrations at representative onshore locations as representative of background concentrations when determining compliance with NAAQS onshore. For example, there appear to be localized $PM_{2.5}$ monitoring data recently collected in the community of Nuiqsut.[209] These data should be used as appropriate background concentrations when determining $PM_{2.5}$ impacts at this location.

3. Collocated Sampling Requirements

When EPA proposed the original Chukchi Sea permit Shell did not operate a collocated $PM_{2.5}$ sampler. We commented that:

> For PSD monitoring, EPA should require collocation at least at one site in the network[210] operating one-in-six days for a sampler operating on a one-in-three day schedule, or one-in-three days for a sampler running every day.[211] EPA must also require quarterly Performance Evaluation Program (PEP) audits of 100

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[209] See "20090826_BS_ Hall email Re_ Fw_ North Slope Particulate.pdf" included as part of the Administrative Record showing $PM_{2.5}$ concentrations collected in Nuiqsut July 21 – August 23, 2009.

[210] 40 C.F.R. § 58 Appendix A §3.2.5.5.

[211] *Id.* § 58 Appendix A §3.2.5.7.

> percent of the network every quarter.[212] Since PSD monitoring sites operate for such a short relative period, it is extremely important to have tight Quality Assurance controls. These requirements should be spelled out in the Quality Assurance Project Plan (QAPP) written by the monitoring organization and approved by the overseeing entity (in this case, the Region). EPA must clearly identify the expectations for how the data being gathered will be used, and what is allowable for the precision and bias values in order to be able to apply the data with a reasonable level of confidence.

Given the fact that both the Wainwright and Badami PSD monitoring sites have been collecting data for less than a year, it is extremely important to have a good measure of the precision and bias of the monitoring network to ensure that the monitoring that is done has tight Quality Assurance controls. There is no reference to a collocated sampler or to the requirement for Shell to operate a collocated sampler in the Beaufort Sea permit or statement of basis. Supplemental materials included in the administrative record discuss the installation of a collocated sampler at Deadhorse but the details of the Quality Assurance Project Plan (QAPP), as they pertain to our original comments for the Chukchi Sea permit on the need for a collocated sampler, quarterly PEP audits, tight precision and bias goals, etc, are not addressed. A review of the QAPP for the Deadhorse monitoring location indicates that, in fact, there will be a collocated $PM_{2.5}$ sampler to evaluate precision and bias in CPAI-Shell's $PM_{2.5}$ network.

According to the PSD requirement for collocated monitors, 40 CFR Appendix A Section 3.2.5.5 states that, for collocated monitors, "[a] site with the predicted highest 24-hour pollutant concentration must be selected." EPA should discuss how this requirement is met, either through monitoring or modeling. The QAPP (p. 13 of 64) only mentions that "[a] station located in Deadhorse likely will have the highest concentrations in the network" but there is no concrete information in support of this claim. This requirement will help ensure the use of a collocated sampler that is best able to measure precision and bias for the network. Further, according to the project schedule, the first quarterly report for the collocated monitor is not due until 30 days after the end of the quarter. Since the collocated sampler was not operational until October 22, 2009 it appears that the report will not be available until mid-February. We would like assurance from EPA that the precision and bias goals established in the QAPP are being met.

E. Ambient Air Boundary.

Shell has applied for a safety exclusion zone for the Discoverer drill ship and the U.S. Coast Guard (USCG) has proposed approval of such a zone.[213] According to the USCG proposal:

> "[t]he purpose of the temporary safety zone is to protect the DRILLSHIP from

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[212] *Id.* § 58 Appendix A §3.2.7.

[213] Safety Zone; FRONTIER DISCOVERER, Outer Continental Shelf Drillship, Chukchi and Beaufort Sea, Alaska, 75 Fed. Reg. 803-807 (Jan. 6, 2010).

> vessels operating outside normal shipping channels and fairways. Placing a temporary safety zone around the DRILLSHIP will significantly reduce the threat of allisions, oil spills, and releases of natural gas, and thereby protect the safety of life, property, and the environment."[214]

We would like to emphasize that nowhere in the proposal for the temporary exclusion zone does it state an intent to change the location of the ambient air boundary for the purposes of demonstrating compliance with Clean Air Act requirements, including compliance with NAAQS and PSD increments. In fact, if has been our longstanding position that regardless of the need for an exclusionary safety zone (to minimize the potential threats to life, property and the environment from allisions, oil spills, etc,) Shell must continue to demonstrate compliance with all CAA requirements at the location of maximum concentration regardless of the safety zone boundary, EPA cannot ignore predicted concentrations just because they occur within a USCG designated safety zone.

F. PSD Increment Applicability.

We strongly support EPA's position on the need for demonstrating compliance with PSD increments on the OCS. Specifically, we agree with EPA's position, articulated in the statement of basis for the proposed permit (at p. 21) that OCS permitting rules applicable to sources further than 25 miles beyond a state's seaward boundary apply in the same manner as the PSD requirements of 40 CFR 52.21 apply to onshore sources. Clearly this includes compliance with the PSD increments for Shell's exploration activities in the Beaufort Sea. Further, we agree that the required air analysis is *not* limited to the impacts of offshore sources to onshore areas. Finally, we agree with EPA's interpretation that the minor source baseline dates of the corresponding onshore area (i.e., February 8, 1988 for NO_2, November 13, 1978 for PM and June 1, 1979 for SO_2) apply in the "Inner OCS" and, therefore, all increment-affecting sources must be considered when modeling increment consumption at receptor locations in the "Inner OCS". Shell's opposition to EPA's interpretation of the minor source baseline dates is unwarranted. As EPA explained in its July 2, 2009 internal memorandum, the COA minor source baseline dates are applicable[215] because the COA requirements apply to sources located within 25 miles from the State's seaward boundary.[216] These are important distinctions and we would like to clearly support EPA's position as it moves forward with this and future OCS permitting actions.

G. Regional Inventory

We request that EPA verify that the regional source inventory used for the proposed permit includes: (1) all major and minor sources for which applications have been deemed complete even if a permit has not been issued by the State of Alaska; and (2) all fugitive and area sources in the region.

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[214] 75 Fed. Reg. at 803

[215] EPA, Internal Memorandum from David C. Bray to Rick Albright and Janis Hastings, RE: Implementing PSD Baseline Dates, Baseline Areas, and Baseline Concentrations on the Outer Continental Shelf in Alaska at 2 (July 2, 2009).

[216] 40 C.F.R. § 55.3(b)

H. Secondary $PM_{2.5}$ formation.

An important consideration in determining $PM_{2.5}$ impacts, which is not accounted for in the modeling for the proposed permit, is the assessment of secondary $PM_{2.5}$ formation in the atmosphere. In addition to primary $PM_{2.5}$ emissions (directly emitted from combustion point sources and from fugitive sources), emissions of NO_x, VOCs, SO_2 and ammonia can form, after being emitted into the atmosphere, into $PM_{2.5}$ and this can potentially be a significant component of ambient $PM_{2.5}$ concentrations.[217] And while primary $PM_{2.5}$ emissions are generally a localized issue, secondary $PM_{2.5}$ emissions can be more regional in scale. Secondary $PM_{2.5}$ formation could be especially important considering the fact that the modeling results presented in the Statement of Basis predict $PM_{2.5}$ concentrations at 83% of the 24-hour NAAQS and are not within the appropriate margin of error when considering the issues with the background concentrations and the accuracy of the data inputs for the analysis.[218] This concern is compounded by the new $PM_{2.5}$ increments, which further raise concerns that Shell may not be able to comply with applicable legal requirements.

The fraction of $PM_{2.5}$ concentrations in the ambient air that is due to the secondary formation of $PM_{2.5}$ (e.g., sulfates and nitrates), as opposed to directly emitted [primary] $PM_{2.5}$ (e.g., as a product of combustion) is dependent on many factors. However, the presence of strong temperature inversions that limit dispersion contribute to the formation of secondary $PM_{2.5}$ in the atmosphere and can increase secondary $PM_{2.5}$ formation. $PM_{2.5}$ concentrations, therefore, can be due to gaseous pollutants that form fine particles after reacting with other compounds in the air during meteorological inversions and it is important for EPA to consider these $PM_{2.5}$ precursor sources (*e.g.*, NO_x from the diesel combustion sources associated with Shell's exploration drilling program) in its OCS permitting. Because of the presence of strong temperature inversions on the North Slope, EPA should seriously consider the contribution from secondary $PM_{2.5}$ to total $PM_{2.5}$ concentrations from the permitted sources on the OCS.

EPA must address how it will account for secondary $PM_{2.5}$ impacts from permitted sources such as Shell's exploration activities. If it will not be directly addressing this issue in Shell's final permit then EPA, at the very least, should give an indication of how it is working to be able to address this important component of $PM_{2.5}$ in future permitting actions. EPA's Support Center for Regulatory Atmospheric Modeling (SCRAM) provides various resources for modeling the impacts of secondary $PM_{2.5}$. For example, EPA's recently-developed model based on the Community Multi-scale Air Quality (CMAQ) model in support of the development of the $PM_{2.5}$ NAAQS has been shown to

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[217] *See* Damberg, Policies for Addressing PM 2.5 Precursors (available at: http://www.epa.gov/ttnnaaqs/pm/presents/policies_for_pm25_precursors-rich_damberg.ppt) (Attachment 22).

[218] EPA Stmt of Basis at Table 5-14.

"reproduce the results from an individual modeling simulation with little bias or error" and "provides a wide breadth of model outputs, which can be used to develop emissions control scenarios".[219] The Comprehensive Air quality Model with extensions (CAMx) is another tool available to assess secondary $PM_{2.5}$ formation. CAMx has source apportionment capabilities and can assess a wide variety of inert and chemically reactive pollutants, including inorganic and organic $PM_{2.5}$ and PM_{10}. The Regional Modeling System for Aerosols and Deposition (REMSAD) can also model concentrations of both inert and chemically reactive pollutants on a regional scale, "including those processes relevant to regional haze and particulate matter".[220] These are just some examples of current models, identified by EPA, with the capability to assess secondary $PM_{2.5}$ impacts. With adequate testing (using existing regional monitoring data to ensure accuracy) these models could be used in the permitting context for larger sources. An alternative to these grid models would be for EPA to develop a screening point source model - like CALPUFF - to look at near-field $PM_{2.5}$ primary and secondary impacts.

There have been several oil and gas Environmental Impact Statements that have already used (or are using) CMAQ or CAMx to estimate $PM_{2.5}$ concentrations. The Uinta Basin Air Quality Study in Utah and the Four Corners Air Quality Group Modeling Project in Colorado are examples of completed modeling studies of this type.[221] And both the Continental Divide and Hiawatha EISs in Wyoming are examples of projects using grid modeling to assess $PM_{2.5}$ concentrations.[222]

We strongly encourage EPA to address – in the statement of basis for the final permit issued to Shell – how it will account for secondary $PM_{2.5}$ formation from permitted sources in the region. The secondary $PM_{2.5}$ component could be critical to understanding the best way to mitigate potential $PM_{2.5}$ impacts.

I. Impacts to regional Ozone.

While we agree that emissions from one permit may not trigger the need for a comprehensive quantitative regional assessment of ozone, the fact that there are at least three OCS exploration projects being permitted in the region in the near future (e.g., Shell's Chukchi and Beaufort Sea programs as well as ConocoPhillips' proposed exploration in the Chukchi Sea which EPA has already received an application for) we strongly urge EPA to commit to a more comprehensive look at the cumulative impacts of these and other reasonably foreseeable sources on concentrations in the region. It is not ok to wait until monitoring shows a problem. Regardless of the source of background concentrations in the area (i.e., whether from transcontinental transport or from local sources) EPA must be able to ensure the public that no source will contribute to ozone exceedances. As EPA continues to permit additional sources of NO_x and VOC in the region, it must be able to determine the cumulative impacts of these sources on future ozone concentrations.

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[219] *See* Technical Support Document for the Proposed PM NAAQS Rule (available at: http://www.epa.gov/scram001/reports/pmnaaqs_tsd_rsm_all_021606.pdf) (Attachment 23).

[220] *See* http://remsad.saintl.com/ (Attachment 24).

[221] *See* Uinta Basin Air Quality Study (UBAQS) News Release at http://ipams.org/wp-content/uploads/2009/05/News-Release-UBAQS.pdf (Attachment 25); Four Corners Air Quality Task Force modeling info at http://www.nmenv.state.nm.us/aqb/4C/Modeling.html (Attachment 26).

[222] *See,* Continental Divide EIS documents at http://www.blm.gov/wy/st/en/info/NEPA/rfodocs/cd_creston.html and Hiawatha EIS documents at http://www.blm.gov/wy/st/en/info/NEPA/rsfodocs/hiawatha.html .

Background concentrations of ozone, as EPA points out, are already as high as 50 ppb (8-hour average) on the North Slope. This background level is already two-thirds of the way to the 8-hour average standard of 75 ppb and over 80% of the way towards the lower range of EPA's proposed revisions to the ozone standard.[223] EPA is proposing to strengthen the 8-hour average ozone standard, designed to protect public health, to a level within the range of 60-70 ppb. EPA's proposal is based on scientific information, including epidemiological and human clinical studies, showing effects in healthy adults at levels as low as 60 ppb.[224]

EPA's proposed permit indicates that it "*believes* that emissions from Shell's exploration operations will not cause or contribute to a violation of the NAAQS for ozone." [Emphasis added] Statement of Basis at 126. However, EPA has yet to complete any analysis of the proposed impacts from exploratory drilling programs on the OCS on ozone concentrations in the region. EPA should more thoroughly address the potential regional ozone impacts from the permitting actions of large air pollution sources on the OCS as it continues to receive applications for exploration activities. This is especially important considering EPA's proposed strengthening of the standard to better protect human health.

Traditionally, elevated ozone levels are thought to be a summertime problem that plagues large urban areas. However, "recent events that have occurred in rural southwest Wyoming in wintertime demonstrate this is not always the case."[225] This raises a potential concern with respect to potential regional ozone formation on the North Slope of Alaska during the non-summer months. According to a recent study by the National Oceanic and Atmospheric Administration, ozone rapidly formed in southwest Wyoming "when three factors converged: ozone-forming chemicals from the natural gas field, a strong temperature inversion that trapped the chemicals close to the ground, and extensive snow cover, which provided enough reflected sunlight to jump-start the needed chemical reactions." [226] The North Slope of Alaska also exhibits these three factors needed for ozone formation. First, industrial sources in the North Slope region have the potential to contribute tens of thousands of tons of NO_x emissions (80,000 TPY) and several thousand tons of VOC emissions (2,500 TPY) to the area each year.[227] These sources and Shell's proposed OCS activities are all contained within an area similar in size to a representative regional ozone study domain (e.g., 400-500 km by 400-500 km). In comparison, the NO_x inventory for the counties that include the Wyoming development field totals just over 60,000 TPY and VOC emissions total just over 10,000 TPY.[228]

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[223] 75 Fed. Reg. 2938, January 6, 2010

[224] EPA's Proposed Revisions to National Standards for Ground-Level Ozone, January 6, 2010, Fact Sheet, available online at http://www.epa.gov/air/ozonepollution/pdfs/fs20100106std.pdf. (Attachment 27)

[225] WYDEQ Sublette County Air Quality Information Page, *see e.g.*, http://deq.state.wy.us/out/downloads/PINEDALE%20April%2008%20Town%20Meeting.pdf) (Attachment 28); *see also* http://www.starvalleyindependent.com/2009/03/governor-concerned-over-southwest-wyoming-ozone-levels/. (Attachment 29).

[226] *See* NOAA's press release (available at: http://www.noaanews.noaa.gov/stories2009/20090118_ozone.html) (Attachment 30); January 18, 2009 for

Second, strong temperature inversions frequently occur in Alaska's North Slope region. Finally, extensive snow cover is persistent in the region from as early as September through June.[229] The Chukchi and Beaufort Seas exploration activities will occur, at least in part, during this period. While there may not be available sunlight in the dead of winter there is certainly abundant sunlight in the fall and spring in conjunction with snow cover and strong temperature inversions. The fact that the pollution sources and photochemical mechanisms for producing ozone are available and the possibility of elevated background concentrations from global transport of pollution is real means that EPA must more thoroughly investigate the effects of NO_x and VOC sources from the proposed exploration activities on the OCS and from existing and reasonably foreseeable NO_x and VOC sources in the region on ozone formation on the North Slope.

Even though monitored levels of ozone in the region do not threaten compliance with the NAAQS, background concentrations as high as 50 ppb (based on daily average data from NOAA/GMD monitoring in Barrow[230]) have been observed. This level is equivalent to background concentrations currently observed in the active oil and gas development areas in the Uinta Basin in northeast Utah.[231] EPA has a regulatory obligation to ensure

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Schnell, R.C., et al. 2009. Rapid photochemical production of ozone at high concentrations in a rural site during winter. *Nature Geoscience* 1-3 (January 18, 2009) (available at: http://www.nature.com/naturegeoscience).

[227] *See* The North Slope Borough Region Emission Summary in Table 3.4.5-8 of the Beaufort Sea and Chukchi Sea Planning Areas Oil and Gas Lease Sales 209, 212, 217, and 221 Draft Environmental Impact Statement, OCS EIS/EA MMS 2008-0055. Total permitted NOx emissions exceed 83,000 TPY and total permitted VOC emissions exceed 2,500 TPY (available at: http://www.mms.gov/alaska/ref/EIS%20EA/ArcticMultiSale_209/2008_0055_deis/vol4k5.pdf) (Attachment 31).

[228] Based on 2005 emissions data presented in meeting notes from Greater Yellowstone Area Clean Air Partnership Annual Meeting, Pocatello, ID, October 17-18, 2007 (available online at http://www.fs.fed.us/r1/gallatin/resources/air/gyacap/docs/GYACAP-Pocatello_2007_Meeting_Notes.doc) (Attachment 32).

[229] *See, e.g.*, the Barrow Snowmelt Date study performed by NOAA's Earth System Research Lab (available at http://www.esrl.noaa.gov/gmd/grad/snomelt.html) (Attachment 33).

[230] *See* World Data Center for Greenhouse Gases (available at: http://gaw.kishou.go.jp/cgi-bin/wdcgg/accessdata.cgi?index=BRW471N00-NOAA&select=inventory (Attachment 34).

[231] Background ozone concentrations in the Uinta Basin, Utah from recent (2008) EAs = 50 ppb (draft Big Pack EA UT-080-06-488, draft River Bend EA UT-080-07-772, draft Southam Canyon EA UT-080-08-342) (available at: http://www.blm.gov/ut/st/en/fo/vernal/planning/nepa_.html).

compliance with the NAAQS. Emissions will dilute as they transport away from their source of origin, but spreading of plumes is not always rapid and is highly dependent on the atmospheric stability at the time. Emissions from Shell's activities could certainly contribute to ozone formation in the region under the right conditions, as described above.

A study looking at future ozone concentrations in the Arctic from increased shipping traffic in the Arctic northern passages determined that ships' combustion engines could increase ozone concentrations in the region by 2-3 times in the decades ahead (with predicted peak concentrations reaching more than 60 ppb_v in July and August).[232] According to the same study, "the photochemical lifetime of ozone [in the Arctic] is rather long, and its deposition velocity on ice and water is small." Furthermore, "[i]n most regions of the troposphere, including the remote Arctic areas where background concentrations of pollutants are particularly low, the formation rate of ozone is limited by the amount of nitrogen oxides that are present in the atmosphere." Thus, it is conceivable that NO_x (and VOC) emissions from Shell exploration activities in the Chukchi and Beaufort Seas could contribute to elevated ozone concentrations in the region, even during the summer months.

We would like to see EPA require a more thorough evaluation of potential ozone impacts in the region from ongoing permitting activity on the OCS. Seeing as how monitored levels of ozone are already over 80% of the level at which EPA has concluded results in health impacts to adults, we are concerned that continued permitting of sources in the region without further analysis may result in adverse health impacts to the region.

IX. Compliance with other Environmental Laws And Requirements is A Necessary Step Toward Protecting the Arctic and the Communities Who Depend Upon It.

Prior to the issuance of any permit to Shell, there are several environmental laws that must be complied with.

A. Compliance With The National Environmental Policy Act is Imperative To Authorizing Hydrocarbon Exploration.

The National Environmental Policy Act (NEPA) is our Nation's "basic national charter for protection of the environment."[233] NEPA declares a national policy "to enrich the understanding of the ecological systems and natural resources important to the

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[232] Granier, C., U. Niemeier, J. H. Jungclaus, L. Emmons, P. Hess, J.-F. Lamarque, S. Walters, and G. P. Brasseur (2006), Ozone pollution from future ship traffic in the Arctic northern passages, *Geophys. Res. Lett.*, *33*, L13807, doi:10.1029/2006GL026180 (available at: http://www.agu.org/pubs/crossref/2006/2006GL026180.shtml) (Attachment 35).

[233] 40 C.F.R. § 1500.1(a).

Nation,"[234] and makes it the "continuing responsibility" of all federal agencies to "preserve important historic, cultural, and natural aspects of our national heritage . . .."[235]

Shell's PSD permit application is related to the company's exploration plans in the Chukchi Sea. Shell is currently proposing exploratory operations in both the Chukchi and Beaufort Seas with related environmental impacts. We asked the Minerals Management Service (MMS) to analyze the impacts from these two Exploration Plans together under the National Environmental Policy Act (NEPA). Unfortunately, this request was not honored. Shell's air emissions received minimal consideration under NEPA because MMS deferred to the EPA's air permitting process.[236] In addition, MMS failed to analyze the impacts from the generation of secondary air pollutants.[237]

Acknowledging the hefty workload Region 10 already has, we ask that whenever possible EPA provide assistance to MMS in analyzing and reviewing the impacts to air and water resources from proposed off-shore drilling operations in the Arctic. [238] It is critical that all the impacts of oil and gas exploration are analyzed under NEPA.

B. EPA has not Complied with the Letter and the Spirit of Section 7 of the Endangered Species Act here.

We appreciate EPA consulting informally with the FWS and NOAA under the Endangered Species Act. In light of the importance of Camden Bay as feeding and resting ground for bowhead whales and the whale's strong olfactory senses, which will be affected by both Shell's air and water emissions, we ask that EPA reinitiate section 7 consultations to ensure bowhead whales will not be adversely affected by Shell's proposed operations. Additionally, unless EPA re-defines the scope of the final Permit to just encompass those well-sites for which Shell sought authorization for under OCSLA for its 2010 exploration program, then formal consultations are necessary to address the on-going impacts from Shell's many years of operations in both the Beaufort and Chukchi Seas and their ramifications for marine life.

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[234] 42 U.S.C. § 4321.

[235] *Id.* § 4331(b)(4).

[236] MMS, Environmental Assessment for Shell Offshore Inc. 2010 Outer Continental Shelf Lease Exploration Plan Camden Bay, Alaska at 18, 27-29, 63-65 (Oct. 2009) (available at: http://www.mms.gov/alaska/ref/EIS%20EA/mms2009_052_ea/2009_1015_EA.pdf). Indeed, MMS explains that "By demonstrating compliance with the applicable NAAQS, AAAQS, and PSD increment standards at the edge of the *Discoverer*, in the immediate vicinity of its support vessels, and at the Beaufort Sea shoreline, the air quality impact analysis prepared for Shell's EPA permit application shows that Shell would not have a significant adverse impact at the nearest villages along the Beaufort Sea coast, Nuiqsut and Kaktovik. Please refer to EA Section 3.4 on air quality for additional discussion.." *Id.* at 63.

[237] *Id.*

[238] 40 C.F.R. § 52.21(s) ("[w]henever any proposed source or modification is subject to action by a Federal Agency which might necessitate preparation of an environmental impact statement pursuant to the National Environmental Policy Act, review by the Administrator conducted pursuant to this section shall be coordinated with the broad environmental reviews under that Act and under section 309 of the Clean Air Act").

Additionally, while we agree that MMS is the lead the agency for Section 7 consultations, as we are sure EPA is aware, MMS decided not to initiate the Section 7 consultation process to review Shell's Exploration Plans. We are concerned that the isolated consultations on just the air emissions on these operations is insufficient to ensure against the jeopardy of listed species that may be affected by entirety of Shell's proposed operations. For this reason, we encourage EPA to work with MMS, FWS, and NOAA in ensuring full compliance with Section 7 of the Endangered Species Act.

C. EPA Must Conduct an Environmental Justice Analysis before Making a Decision on Shell's Permit Application.

Under Executive Order No. 12898, EPA must consider and address, when appropriate, "disproportionately high and adverse human health and environmental effects of [their] programs, policies, and activities on minority and low-income populations."[239] When issuing PSD permits, the EAB has required that the permitting agencies provide details about the required environmental justice analysis.[240]

In the statement of basis for the draft permit, EPA recognizes that the Alaskan Natives, a minority population, make up a significantly large portion of the potentially impacted communities.[241] As previously discussed in section III, Shell's operations will contribute to global warming effects that will harm the Arctic and threaten the livelihood of those native communities.

We appreciate EPA's efforts at meeting with affected North Slope communities and listening to their concerns regarding the proposed air and water permits in the Chukchi Sea. However, EPA's continued reliance upon Shell's compliance with the NAAQS to determine that Shell's air emissions will not harm human health and welfare is insufficient here.

Even though the NAAQS are supposed to protect human health with an adequate margin of safety, CAA § 109(b),[242] the standards often do not. EPA has failed to update the NAAQS every five years as required, thus the NAAQS do not always reflect the current state of technological and scientific knowledge about criteria pollutants. Even when EPA revises the NAAQS, the agency does not always adopt the most protective standard recommended by the Clean Air Scientific Advisory Committee to protect human health and welfare. In fact, the U.S. House Committee on Oversight and Government Reform documented how political considerations trumped health recommendations in the March 2008 determination of the NAAQS for Ozone.[243]

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[239] *See* Exec. Order No. 12,898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, 59 Fed. Reg. 7,629, 7,632-33 (Feb. 11, 1994).

[240] *See In re: Knauf Fiber Glass*, PSD Permit No. 97-PO-06, 8 E.A.D. 121, 175 (1999) (remanding PSD permit to the permitting agency to include the environmental justice analysis in the record).

[241] EPA Chukchi Re-Proposed Stmt of Basis at 113.

[242] 42 U.S.C. § 7409(b).

Particulate matter provides a compelling example that the NAAQS are insufficient to protect public health. In the most recent revision of the NAAQS for PM, EPA documented the health problems associated with exposure to particulate matter, including chronic respiratory disease, asthma, lung cancer, and cardio-respiratory mortality.[244] EPA found that epidemiological studies revealed a linear relationship between health problems, notably cancer, and the ambient concentration of particulate matter. EPA could not determine a threshold for particulate matter concentrations under which no human health effects would occur.[245] This evidence suggests that any level of particulate pollution will have human effects, thus the PM NAAQS is not protective of human health. Due to the unreliability of the NAAQS, EPA cannot conclude that Shell's purported compliance with the NAAQS will protect the health and welfare of the native communities in the surrounding area.

Additionally, EPA has found that there are human health hazards associated with exposure to diesel exhaust. In the *Health Assessment Document for Diesel Engine Exhaust*, EPA explained that some of these health hazards include "acute exposure-related symptoms, chronic exposure related noncancer respiratory effects, and lung cancer."[246] Notably, EPA found that diesel engine exhaust is "likely to be carcinogenic to humans by inhalation" through environmental exposures.[247] EPA must consider whether or how these human health hazards will affect the native communities that are on-shore from Shell's operations. Thus, EPA must conduct an independent analysis to determine the impact of Shell's activities on the health and welfare of the native communities in the Chukchi Sea.

X. The Need for Meaningful Public Involvement and Accuracy in Rendering Decisions on Shell's OCS Permits.

Throughout the permitting process, Shell has asked EPA to issue the OCS PSD permits as quickly as possible. The record abounds with examples of a rushed approach by the Shell toward the need for time to properly evaluate and issue the first set of major source OCS PSD permits. For example, in September 2009, Shell sent a letter to EPA to

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[243] *See* Memo Re: Supplemental Information on the Ozone NAAQS, May 2008 (available at oversight.house.gov/documents/20080520094002.pdf) (Attachment 36).

[244] *See* EPA National Ambient Air Quality Standards for Particulate Matter; Final Rule. 71 Fed. Reg. 61144, 61154 (Oct. 17, 2006).

[245] *See* EPA National Ambient Air Quality Standards for Particulate Matter; Proposed Rule, 71 Fed. Reg. 2620, 2635.

[246] Health Assessment Document for Diesel Exhaust (available at http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=29060 at 1-3(May 2002)) (Attachment 37).

[247] *Id.* at 1-4 and 1-5.

"reaffirm Shell's need to have both permits issued in final form by R10 by at least the end of 2009."[248]

This approach is unwarranted because the delay in the permitting process is a result of applicant's own actions. EPA informed Shell "[a]s early as April, 2008" that it needed to "start a preconstruction ambient air quality monitoring program for all criteria air pollutants consistent with the PSD regulation and guidance if they intended to propose projects in the Beaufort Sea OCS in the near future."[249] Shell neglected to collect this data waiting instead for another company to set-up a monitoring station that generated data Shell is now utilizing in its permit applications.

In response to an earlier letter from Shell asking EPA to expedite the permitting process, EPA explained to Shell Alaska's General Manager:

> I must reiterate that the delay in receiving updated emissions information in turn delayed our ability to work on drafting the permit and support documents. . . Shell has still been slow to provide other information, such as the Wainwright monitoring data and the requests for Letters of Authorization (LOA's) . . . [t]he lateness of some of this information is making it extremely difficult for us to meet our target of putting a draft permit out for public notice by mid-August.[250]

Most recently, Shell has requested that EPA finalize the Chukchi permit "within 10 days of the close of the comment period" and expedite the Beaufort permitting process.[251] Logistically, it would be next to impossible for EPA to meet its obligations to even respond to all comments in a meaningful way within a 10-day period. EPA has also received correspondence, through a July 30, 2009 letter to EPA from Alaskan Congressmen, advocating for EPA to complete permits for "certain offshore oil and gas exploration . . . in the Chukchi Sea and Beaufort Sea" within 2009 and stating that oil exploration "must . . . proceed without bureaucratic impediments."[252]

We applaud EPA for taking the requisite time to analyze Shell's application materials, to require Shell to complete deficiencies in its application, and to re-issue a draft permit for the Chukchi operations. Despite Shell's request for EPA to issue these permits by a certain date, EPA must ensure that these permits meet the CAA's legal requirements. Finalizing inadequate or legally deficient permits would circumvent the CAA's goals.

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[248] Letter from Peter Slaiby, Vice President Shell Alaska to Michelle L. Pirzadeh, Acting Regional Administrator, EPA Region 10 (September 1, 2009) (Attachment 38).

[249] Letter from Richard Albright, EPA to Susan Childs, Shell at 11 (Sept. 4, 2009).

[250] Letter from Michelle L. Pirzadeh to Peter Slaiby (July 27, 2009) (Attachment 39).

[251] Letter from Peter E. Slaiby to Gina McCarthy (January 4, 2010) (Attachment 40).

[252] Letter from Senators Lisa Murkowski and Mark Begich and Congressman Don Young to Michelle Pirzadeh (July 30, 2009) (Attachment 41).

We must however, express our disappointment that our organizations, locally affected communities, and the general public were not provided at least 45 days to comment on Shell's draft Beaufort air permit despite NSB's request for an extension of the comment period. While Shell is proposing to use the same vessels for both its Chukchi and Beaufort operations, there are significant differences between the draft permits for these operations proposed by EPA. Most notably, the Beaufort permit required additional analysis under Alaska's requirements for air permits that the Chukchi permit did not require. Numerous comment periods, hearings, and meetings with agency officials pertaining to Shell's operations have been held in recent months in our communities, so it is important that our requests for extensions of time be considered in light of the tremendous burden these exploration plans have placed on our communities.

The problems with Shell's request to EPA for a rushed permitting process came to light through a recent agency oversight. On March 16, 2010, less than a week before the comment period for the Beaufort permit closed, EPA released Appendix A to the public. Prior to this date, EPA had neglected to attach the Appendix to the statement of basis or upload it to the agency's website with the other relevant permitting documents. Appendix A includes information that is crucial to the public's analysis of the permit and the delay in receiving it is fatal to an informed public commenting process. Most importantly, this agency oversight provides evidence of the problems that arise through rushed permitting processes. If pressure on EPA caused the agency to neglect a simple attachment to the agency's own statement of basis, the public is left wondering what other mistakes and oversights the agency made while trying to comply with Shell's request for tight deadlines. Additionally, the generally disorganized state of the record for the permit also made it difficult to effectively provide public comment during the shortened public comment period. As these examples demonstrate, a rushed permitting process now may result in legally deficient permits that will even further delay Shell's proposed operations.

We ask that EPA re-open the comment period on Shell's Beaufort permit and provide the public with the time and the permit record it deserves to provide meaningful input on operations with significant meaning for our air quality. We also request that EPA provide a response to our comments and carefully consider the important legal and factual issues posed by Shell's permit applications before rushing to approve the permits by an arbitrary deadline.

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Inupiat Community of the Arctic Slope
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Index of Attachments to AEWC, ICAS, and NSB Beaufort OCS PSD Permit Comments

1. International Panel on Climate Change, Climate Change: 2007 Synthesis Report, at 30 (Attachment 1).

2. "Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle", EPA420-F-05-004 February 2005 (Attachment 2).

3. EPA, Program Announcement: International Maritime Organization Adopts Program to Control Air Emissions from Oceangoing Vessels (2008) (Attachment 3).

4. EPA Methane Information (Attachment 4).

5. Fact Sheet -- Proposed Rule: Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule (Attachment 5).

6. Background information on the Proposed Mandatory GHG Reporting Rule (Attachment 6).

7. Hyperion Energy Center BACT Analysis for CO_2 (March 2009) (Attachment 7).

8. "Fact Sheet Final Revisions to the National Ambient Air Quality Standards For Nitrogen Dioxide" (Attachment 8).

9. Letter from John Groll, MMS to EPA at 2 (Oct. 2, 2009) (Attachment 9).

10. AEWC comments at 14 (Attachment 10).

11. EPA, Memorandum from Douglas E. Hardesty to Robert R. Robichaud, Re: Forest Oil Kustatan Facility and Osprey Platform Construction Permitting Applicabilitv Determination (Aug. 21, 2001) (Attachment 11).

12. EPA, Memorandum from Director to Clyde B. Eller, Re: Shell Oil Company Wilmington Complex Specification of "Source" (May 16, 1980) (Attachment 12).

13. Shell Chukchi Sea ODPCP (Attachment 13).

14. EPA 420-S-06-002, Diesel Retrofit Technology: An Analysis of the Cost-Effectiveness of Reducing Particulate Matter Emissions from Heavy-Duty Diesel Engines Through Retrofits, March 2006, p. ii (Attachment 14).

15. EPA's Emerging Technology list (Attachment 15).

16. Gekas I P, "NOx Reduction Potential of V-SCR Catalyst in SCR /DOC/DPF Configuration Targeting Euro VI Limits from High Engine NOx Levels", Society of

Automotive Engineers (SAE), Document Number: 2009-01-0626, April 2009 (Attachment 16).

17. Servati H B, Petreanu S,Marshall S E,Su H, Marshall R, Wu C-H, Hughes K, Simons L, Berrimann L, Zabsky J, Gomulka T, Rinaldi F, Tynan M, Salem J, Joyner J, "A NOx Reduction Solution for Retrofit Applications: A Simple Urea SCR Technology", SAE, Document Number: 2005-01-1857, April 2005 ((Attachment 17).

18. TeamTec Marine Product Brochure (Attachment 18).

19. Wilson, Darcy, Richard Billings, Regi Oommen, and Roger Chang, Eastern Research Group, Inc. *Year 2005 Gulfwide Emission Inventory Study*, U.S. Department of the Interior, Minerals Management Services, Gulf of Mexico OCS Region, New Orleans, December 2007, Section 5.2.10 (Attachment 19).

20. EPA, Regulatory Announcement (Attachment 20).

21. Letter from Johnny Aiken, North Slope Borough, to Natasha Greaves and Dan Meyer, EPA Region 10 (May 11, 2007) (Attachment 21).

22. Damberg, Policies for Addressing PM 2.5 Precursors (Attachment 22).

23. Technical Support Document for the Proposed PM NAAQS Rule (Attachment 23).

24. http://remsad.saintl.com/ (Attachment 24).

25. Uinta Basin Air Quality Study (UBAQS) News Release at http://ipams.org/wp-content/uploads/2009/05/News-Release-UBAQS.pdf (Attachment 25).

26. Four Corners Air Quality Task Force modeling info (Attachment 26).

27. EPA's Proposed Revisions to National Standards for Ground-Level Ozone, January 6, 2010, Fact Sheet (Attachment 27).

28. WYDEQ Sublette County Air Quality Information Page (Attachment 28).

29. http://www.starvalleyindependent.com/2009/03/governor-concerned-over-southwest-wyoming-ozone-levels/. (Attachment 29).

30. NOAA's press release (Attachment 30).

31. The North Slope Borough Region Emission Summary in Table 3.4.5-8 of the Beaufort Sea and Chukchi Sea Planning Areas Oil and Gas Lease Sales 209, 212, 217, and 221 Draft Environmental Impact Statement, OCS EIS/EA MMS 2008-0055. Total permitted NOx emissions exceed 83,000 TPY and total permitted VOC emissions exceed 2,500 TPY Attachment 31).

32. Meeting notes from Greater Yellowstone Area Clean Air Partnership Annual Meeting, Pocatello, ID, October 17-18, 2007 (Attachment 32).

33. Barrow Snowmelt Date study performed by NOAA's Earth System Research Lab (Attachment 33).

34. World Data Center for Greenhouse Gases (Attachment 34).

35. Granier, C., U. Niemeier, J. H. Jungclaus, L. Emmons, P. Hess, J.-F. Lamarque, S. Walters, and G. P. Brasseur (2006), Ozone pollution from future ship traffic in the Arctic northern passages, *Geophys. Res. Lett.*, *33*, L13807, doi:10.1029/2006GL026180 (Attachment 35).

36. Memo Re: Supplemental Information on the Ozone NAAQS, May 2008 (Attachment 36).

37. Health Assessment Document for Diesel Exhaust (Attachment 37).

38. Letter from Peter Slaiby, Vice President Shell Alaska to Michelle L. Pirzadeh, Acting Regional Administrator, EPA Region 10 (September 1, 2009) (Attachment 38).

39. Letter from Michelle L. Pirzadeh to Peter Slaiby (July 27, 2009) (Attachment 39).

40. Letter from Peter E. Slaiby to Gina McCarthy (January 4, 2010) (Attachment 40).

41. Letter from Senators Lisa Murkowski and Mark Begich and Congressman Don Young to Michelle Pirzadeh (July 30, 2009) (Attachment 41).

Mr. WHITFIELD. Thank you. Mr. Glenn, you are recognized for 5 minutes.

STATEMENT OF RICHARD K. GLENN

Mr. GLENN. Thank you. Can you hear me?

Chairman Whitfield, Ranking Member Rush, and subcommittee members, my name is Richard Glenn and I live in Barrow, Alaska. I am executive vice president of Lands and Natural Resources for the Arctic Slope Regional Corporation.

The Arctic Slope Regional Corporation is one of the 12 land-based Native regional corporations created pursuant to the Alaska Native Claims Settlement Act of 1971. ASRC owns approximately 5 million acres of land and is owned by the 11,000 Inupiat Eskimo shareholders that mostly reside in 8 villages of Alaska's North Slope.

This discussion is timely. Right now, our region is preparing to assemble our leadership on this very topic. And we find that this issue boils down to community survival. Our villages are small and they are separated by great distance. No roads connect our villages. Barrow is located 340 miles north of the Arctic Circle, near the boundaries of the Chukchi and Beaufort Seas. We might not be able to see Russia from our front window, but we can sure see the changing Arctic and the Chukchi and Beaufort Sea.

This is a region of tundra plains. It is devoid of trees. The average temperature in winter, well below zero. In Barrow where I live, the ground is frozen down to about 1,000 feet below surface. In our remote village, fuels can cost more than $10 a gallon; milk, $11 a gallon; diapers, $22. Despite these challenges, as my friend Rosemary said, the Inupiat have endured for centuries. We have a close relationship with both the land and the sea.

In my lifetime, our communities have gone through great change. Today, our "villages" are really small cities. They have small city needs: power plants, water and sewer facilities, health services, fire protection, roads, and schools. Our people depend on these services which are provided for by our home rule municipality, the North Slope Burrow. It is the largest county in the country. It is based on locally-derived property taxes that they are based on oil and gas exploration in our region. There is essentially no other economy in our region.

The volume of oil being produced in Alaska is in steep decline, as this committee has heard. This threatens the future of our communities and our culture that we have worked so hard to sustain. We have asked ourselves, what will our grandchildren do? Where will they go to school? What will power their villages?

We understand that current onshore resources are not enough to stem the decline in production, which directly affects our communities. It may seem odd to some of you that Eskimos in Northern Alaska are seeking ways to increase the volume of oil moving through the Trans-Alaska Pipeline, but here we are. Safe and responsible oil and gas development is the only industry that has remained in our region long enough to foster village improvements. We have coal, natural gas, and oil, and in some places in our region, we have them in great abundance. Development of these resources is critical to our survival.

The people of the North Slope also have a heightened concern for the environmental effects of oil and gas exploration and development. No one has more at stake than we do regarding environmental risks. The animals that we depend upon for our food and our culture migrate over large ranges in the land and in the ocean. Like most of my fellow community members, I depend on them. I depend on the sea resources for sustenance. I have served as a co-captain in my extended family's whaling crew.

In studying the issues related to offshore development, we focused on safety and prevention. And we were favorably impressed by the timing, the technology, and the safeguards introduced by Alaska's OCS explorers. Our eyes are open on this issue. We know there are risks and we believe they have been mitigated appropriately.

Regarding air quality, we note that the exploration areas in the Arctic are more than 50 miles away from the nearest community. There are also significantly fewer drilling operations envisioned for the Alaska OCS than the Gulf of Mexico. We question why, despite these differences, there are Clean Air Act requirements that apply to OCS sources in Alaska that don't apply to those same sources in the Gulf of Mexico.

Thank you for giving this important issue your attention. Our intent is to remain at the table with both government and industry. Let me be clear. Without development in our region, our communities will not survive. Please allow us to meet our responsibilities to our grandchildren and future generations. As Congress goes forward and debates this issue, remember the impacts your decisions will have on our communities, our culture, and our people.

[The prepared statement of Mr. Glenn follows:]

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arctic slope
regional corporation

Committee on Energy and Commerce
Subcommittee on Energy and Power Hearing
on
The American Energy Initiative
April 13, 2011

Written Testimony
of
RICHARD K. GLENN, Executive Vice-President of Lands and Natural Resources
Arctic Slope Regional Corporation

Chairman Whitfield, Ranking Member Rush, and distinguished members of the subcommittee, thank you for allowing me this opportunity to provide comments today. My name is Richard Glenn and I am the Executive Vice President of Lands and Natural Resources for Arctic Slope Regional Corporation. I live in Barrow, Alaska. My professional background is in geology and arctic geologic processes. Like most of my fellow community members, I also depend on the land and sea resources for sustenance, and have served as the co-captain in my family's whaling crew.

The Arctic Slope Regional Corporation is one of the 12 land-based Native regional corporations created pursuant to the Alaska Native Claims Settlement Act of 1971.

ASRC owns approximately 5 million acres of land, and represents the interests of approximately 11,000 Iñupiat Eskimo shareholders, that mostly reside in eight communities within Alaska's North Slope.

This discussion is timely. Our region is preparing to assemble our leadership to discuss this very topic. We find this issue boils down to community survival.

Our villages are small and separated by great distance in an area about the size of Minnesota. No roads connect our villages. Barrow, my home town, is a coastal community located 340 miles north of the Arctic Circle, near the boundaries of both the Chukchi and Beaufort Seas.

This is a region of tundra plains, devoid of trees, with an average annual temperature of around 10 degrees Fahrenheit. In Barrow, the ground is frozen to a depth of about a thousand feet. In our more remote villages, fuel can cost ten dollars or more per gallon. Milk costs more than $11.00 per gallon. An average packet of diapers costs about $22.00. Despite these physical and current economic challenges, the Inupiat have endured. We have done so for centuries. We have a demonstrated close relationship with both the land and sea in our region.

In just my lifetime, our communities have gone through great change, with developments that have improved the quality of life from formerly very harsh conditions. Today, our "villages" are actually small cities with small city needs: reliable power, water and sewer treatment facilities, health services, fire protection, airports and schools.

Our people depend on these services. Our culture and traditional subsistence activities depend on both a healthy environment and safe viable communities. We have not looked to many federal or even state-funding sources to build our community improvements. They were developed thanks to our home-rule municipality, the North Slope Borough, and a locally-derived property tax base based on oil and gas exploration.

There is essentially no other economy in our region. As the committee may already be aware, the volume of oil being produced in Alaska is in deep decline, producing today at about one-third the rate of its peak production of two million barrels per day and continuing to drop every year. This decline has caused us to question the future of the communities that we have worked so hard to improve. We have asked ourselves: where will our grandchildren go to school, will we be able to provide future health services, what will power their villages, or will their communities be sustained?

We understand that the currently-known onshore resources are not enough to stem the decline in production; they only reduce its severity. Oil and gas, as they say, is where you find it. In our region we have a mixed blessing. We have hydrocarbons-coal, natural gas and oil, and in some places we have them in abundance. This is true for both the onshore and the offshore.

It may seem counterintuitive to some that Iñupiat Eskimos in Northern Alaska are seeking ways to increase the volume of oil moving through the Trans-Alaska Pipeline, but here we are. Safe and responsible oil and gas development is the only industry that has remained in our region long enough to foster village improvements that have improved our quality of life. Such development is important to us, perhaps even more than to our state and nation.

ASRC and, in general, the people of the North Slope have a heightened concern for the environmental effects of oil and gas exploration and development. We live there; and no one has more at stake than we do regarding environmental risks. The animals that we depend upon for our food and culture migrate over large ranges on the land and in the ocean.

In studying the issues related to offshore development, we focused on safety and prevention. We were favorably impressed by the timing, technology and safeguards introduced by the Alaska OCS explorers. In answering the concerns of our local governments and the Alaska Eskimo Whaling Commission, we believe that Shell has truly stepped up and raised the bar for exploration in the OCS. Our eyes on this issue are open; we know there are risks and we believe that they have been mitigated appropriately.

Regarding air quality and emissions related to drilling development in the Arctic, we note that the exploration areas are more than fifty miles away from the nearest community. There are also significantly fewer drilling operations envisioned for the Alaska OCS than, for example, the Gulf of Mexico. Nevertheless, there are Clean Air Act requirements that apply to OCS sources in Alaska that do not apply to those same sources in the Gulf of Mexico.

We question why there are more stringent air quality requirements for sources in the Alaska OCS than for sources in the Gulf of Mexico, especially given the relatively short intervals during which the drilling operations will be conducted in Alaska. We understand air quality modeling results, including those submitted by Shell in support of its applications for permits, demonstrate that impacts of emissions are within acceptable EPA limits.

ASRC supports a more consistent methodology when applying air quality standards in Alaska's OCS. We also support language clarifying that the point where air quality impacts should be measured is at the corresponding onshore area – this is consistent with the original intent of the language of Section 328.

Mr. Chairman and Committee members, thank you for giving this important issue your attention. Our intent is to remain at the table with both government agencies and industry explorers. I ask you not to prevent us from meeting our responsibility to our grandchildren and future generations. As Congress goes forward to debate this issue, I ask you to remember the impacts that that your decisions will have on our communities, our culture and our people.

Mr. WHITFIELD. Thank you, Mr. Glenn. Dr. Goldsmith, you are recognized for 5 minutes.

STATEMENT OF SCOTT GOLDSMITH

Mr. GOLDSMITH. Thank you, Chairman Whitfield, Ranking Member Rush, and committee members. My name is Scott Goldsmith. I have been a professor of economics at the University of Alaska for 35 years and recently co-authored a study of the economic effects on the State from development of the oil and gas resources from the OCS off the North Shore of Alaska. Funding for the study was provided by Shell Exploration and Production. I am testifying on my own behalf and not as a representative either of the university or Shell.

In 2006, the Department of Interior MMS estimated that the undiscovered, economically recoverable oil in the Beaufort and Chukchi Seas was 12.5 billion barrels—assuming $60 as a price of oil—more than the initial estimate of recoverable oil from Alaska's Prudhoe Bay field, the largest ever discovered in North America. The economically-recoverable natural gas was estimated to be 50 trillion cubic feet.

Industry interest in the Alaska OCS is reflected in the 3 recent lease sales. 2 sales in the Beaufort Sea in 2005 and 2007 generated $367 million in bonuses and 1.1 million acres leased. The Chukchi sale in 2008 generated $2.3 billion in high bids and 2.8 million acres leased.

Development of these resources could result in production of more than 1 million barrels of oil a day for more than a generation. This could reduce foreign imports, currently 10 million barrels per day, by 10 percent and improve our balance of trade by $36 billion a year, assuming $100 per barrel of oil.

Of course there are many technical, economic, logistical, environmental, and other challenges to achieving that production goal, and under the best of conditions it would take nearly a decade to reach first production. At the time our study was done, we projected that production could begin in 2018. Today, first production is still at least 10 years away, in 2021.

Petroleum has been the most important economic driver for Alaska since it became a State in 1959. The economy today would be half as big without petroleum and hard-pressed to support a basic level of services for its citizens. Without petroleum about 60 percent of all jobs would be dependent on the Federal Government.

16 billion barrels of oil has been produced from state lands on the North Slope over the last 35 years, but the largest fields—Prudhoe Bay and Kuparuk—have been in decline for 20 years. Development of nearby small fields, hard-to-reach reservoirs, and unconventional reserves face economic challenges, and all projections are for a continued decline in onshore production. Because of this, the State faces an uncertain future. Providing industry access to petroleum reserves on federal lands offers the best path to continued economic prosperity for the State.

OCS development could add an annual average of 35,000 jobs to the Alaska economy over the next 50 years, offsetting the likely job loss from the continued decline of production on state lands. These would be high-paying year-round jobs with a combined payroll of

$75 billion. These jobs and the sales of Alaskan businesses providing support activities could be the foundation for a sustainable economy for the State for a more than a generation.

Under current law the Federal Government retains essentially all the public revenues from leases, bonuses, and royalties from the Alaska OCS. We estimate state revenues of $17 billion spread over 50 years. Local governments directly impacted by development would receive $3.5 billion over that same period. These revenues would be small compared to current state spending, but large compared to the communities on the North Slope.

Alaska OCS development could also generate annual average employment of 28,500 in the rest of the US and substantial revenues. At an oil price of $100, federal revenues from royalties, income taxes could be $226 billion over the next 50 years. State income and sales taxes outside Alaska could be $7 billion. Moving forward with the Alaska OCS would enhance the potential for further development of Alaska's other petroleum resources.

Alaska OCS development would enhance the viability of a gas pipeline to supply Alaska natural gas to the lower 48 because it would increase the amount of gas available to a pipeline. OCS oil flowing through the Trans-Alaska Pipeline would keep the cost of transportation low, enhancing the economic viability of smaller onshore reserves. It would extend the useful life of the pipeline that some suggest is in danger of shutting down from technical challenges. It would increase the options for development of unconventional resources. Delays in development put these opportunities at risk.

Because of petroleum, the Alaska economy has remained relatively strong through the recent recession. But oil production today is only 1/3 the level of 20 years ago and continuing to fall at 6 percent a year. Looking forward, Alaskans are asking what will sustain the economy for the next generation and understandably concerned. Moving forward with OCS development would be a strong positive signal that opportunities exist for a strong economic future for the State and its citizens.

[The prepared statement of Mr. Goldsmith follows:]

IMPACT OF OCS DEVELOPMENT ON THE ALASKA ECONOMY

Prepared Written Testimony
Oliver Scott Goldsmith
Professor of Economics
Institute of Social and Economic Research
University of Alaska Anchorage

US House of Representatives Committee on Energy and Commerce
Subcommittee on Energy and Power
April 13, 2011
Washington DC.

I have been a professor of economics at the University of Alaska for 35 years and recently co-authored a study of the economic effects on the state of Alaska from development of the oil and gas resources from the Outer Continental Shelf (OCS) off the North Slope of Alaska. Funding for the study was provided by Shell Exploration and Production. I am testifying on my own behalf and not as a representative of the University of Alaska Anchorage or Shell.

In 2006 the Department of Interior Minerals Management Service (now BOEMRE—Bureau of Ocean Energy Management Regulation and Enforcement) estimated that the undiscovered, economically recoverable oil in the Beaufort and Chukchi Seas was 12.5 billion barrels (assuming an oil price of $60), more than the initial estimate of recoverable oil from Alaska's Prudhoe Bay field—the largest ever discovered in North America. The economically recoverable natural gas was estimated to be 50 trillion cubic feet.

Industry interest in the Alaska OCS is reflected in the three recent lease sales. Two sales in the Beaufort Sea in 2005 and 2007 generated $367 million in bonuses and 1.1 million acres leased. The Chukchi least sale in 2008 generated $2.3 billion in high bids and 2.8 million acres leased.

Development of these resources could result in production of more than 1 million barrels of oil per day for more than a generation. This could reduce foreign imports, currently 10 million barrels per day, by 10 percent and improve our balance of trade by $36 billion a year (at $100 per barrel cost of imported crude).

Of course there are many technical, economic, logistical, environmental, and other challenges to achieving that production goal, and under the best of conditions it would take nearly a decade to reach first production. At the time our study was done, we projected that production could begin by 2018. Today first production is still at least 10 years away, in 2021.

Petroleum has been the most important economic driver for the Alaska economy since it became a state in 1959. The economy today would be half as big without petroleum and hard pressed to support a basic level of services for its citizens. Without petroleum about 60 percent of all jobs would be dependent on the federal government.

16 billion barrels of oil has been produced from state lands on the North Slope over the last 35 years, but the largest fields—Prudhoe Bay and Kuparuk--have been in decline for 20 years. Development of nearby smaller fields, hard to reach reservoirs, and unconventional reserves face economic challenges and all projections are for a continued decline in onshore production. Because of this the state economy faces an uncertain future. Providing industry access to petroleum reserves on federal lands, onshore as well as those in the OCS, offers the best path to continued economic prosperity for the state.

OCS development could add an annual average of 35 thousand jobs to the Alaska economy over the next 50 years, offsetting the likely job loss from the continued decline of production on state lands. These would be high paying year round jobs with a combined payroll of $75 billion (2010 $). These jobs and the sales of Alaska businesses providing support activities to the petroleum industry could be the foundation for a sustainable economy for the state for a more than a generation.

Under current law the federal government retains essentially all the public revenues from lease bonuses, rents, and royalties from the Alaska OCS. We estimate state revenues of $17 billion spread over 50 years (assuming oil at $100 per barrel). Local governments directly impacted by development would receive $3.5 billion over that same period. These revenues would be small compared to current state spending, but large compared to the communities on the North Slope.

Alaska OCS development could also generate annual average employment of 28.5 thousand in the rest of the US and substantial revenues for the federal and other state governments. At an oil price of $100, federal revenues from royalties , the corporate income tax, and the personal income tax could be $226 billion (2010 $) over the next 50 years. State income and sales taxes outside Alaska could be $7 billion.

Moving forward with the Alaska OCS would enhance the potential for further development of Alaska's other petroleum resources.

Alaska OCS development would enhance the viability of a gas pipeline to supply Alaska natural gas to the lower 48 market because it would increase the amount of gas available to a pipeline and drive down the unit cost of transportation through that pipeline.

OCS oil flowing through the Trans Alaska pipeline would keep the cost of transportation low, enhancing the economic viability of smaller onshore reserves. It would extend the useful life of the pipeline that some suggest is in danger of shutting down from technical challenges associated with low throughput. It would increase the options for development of unconventional petroleum reserves like heavy oil that need to be mixed with light oil to flow easily through a pipeline.

Delays in development put these opportunities at risk.

Because of petroleum, the Alaska economy has remained relatively strong through the recent recession. But oil production today is only 1/3 the level of 20 years ago and continuing to fall at 6 percent each year. Looking forward, Alaskans are asking what will sustain the economy for the next generation and understandably concerned. Moving forward with OCS development would be a strong positive signal that opportunities exist for a strong economic future for the state and its citizens.

ATTACHMENTS

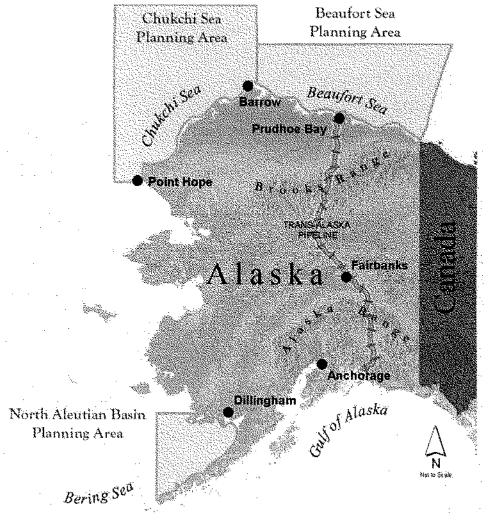
Oliver Scott Goldsmith Resume

Economic Analysis of Future Offshore Oil and Gas Development: Beaufort Sea, Chukchi Sea, and North Aleutian Basin, Prepared for Shell Exploration and Production, March 2009, by Northern Economics and the Institute of Social and Economic Research, University of Alaska Anchorage.

Potential National-Level Benefits of Alaska OCS Development, Prepared for Shell Exploration and Production, February 2011, by Northern Economics and the Institute of Social and Economic Research, University of Alaska Anchorage.

"*What Drives the Alaska Economy?*" UA Research Summary No. 13, by (Oliver) Scott Goldsmith, Institute of Social and Economic Research, University of Alaska Anchorage, 2008.

"*Oil Pumps Alaskan's Economy to Twice its Size—But What's Ahead?*" UA Research Summary No 17, by (Oliver) Scott Goldsmith, Institute of Social and Economic Research, University of Alaska Anchorage, 2011.



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Abbreviations

2D	2-dimensional
3D	3-dimensional
ADF&G	Alaska Department of Fish and Game
AEB	Aleutians East Borough
AGIA	Alaska Gasline Inducement Act
ANS	Alaska North Slope
ANWR	Arctic National Wildlife Refuge
Bbbl	billion barrels
BBO	billions of oil and condensate
BBOE	billions of barrels of oil or energy-equivalent basis
Bcf	billion cubic feet
BOE	barrels of oil or energy-equivalent
bopd	barrels of oil per day
Btu's	British Thermal Units
CIAP	Coastal Impact Assessment Program
CPS	Coastal Political Subdivisions
EIA	Energy Information Administration
EIS	Environmental Impact Statement
IMPAK	Economic Impact Model for Petroleum Activities in Alaska
ISER	Institute of Social and Economic Research, University of Alaska Anchorage
LNG	Liquefied natural gas
MAP	Man in the Arctic Program
MMBO	million barrels of oil
MMBC	million barrels of condensate
mmcf	million cubic feet
MMS	Minerals Management Service
NAB	North Aleutian Basin
NPDES	National Pollutant Discharge Elimination System
NPR-A	National Petroleum Reserve-Alaska
NSB	North Slope Borough
OCS	outer continental shelf
OCSLA	Outer Continental Shelf Lands Act
TAPS	Trans-Alaska Pipeline System
TCF	trillion cubic feet
TCFG	trillion cubic feet of gas
UERR	Undiscovered Economically Recoverable Resources
UTRR	Undiscovered Technically Recoverable Resources

Executive Summary

This study describes and quantifies the potential economic benefits to the State of Alaska and local communities from developing oil and gas resources in Alaska's Outer Continental Shelf (OCS) areas. The findings of this study are not predictions of the future for Alaska, but rather they describe a reasonable approach that one might expect for OCS development. The findings also provide a basis for thinking about potential actions that state and local governments, industry, and other stakeholders might undertake to deal most effectively with the effects that do occur.

While there have been other studies in the past that looked at the potential effects of OCS development, this study is based on more recent information and represents the current state of knowledge in OCS resource estimates, exploration, development, and production activities; recent technology improvements; and state and local government fiscal systems. The economic benefits described here are based on assumptions about when and how OCS development, as well as other economic development in the state, might occur during the next 50 years.

The magnitude of the economic effects of OCS development are contingent on assumptions about petroleum prices, volumes of OCS resources that might be economically recoverable, the levels of investment that the petroleum industry would be willing to spend to develop in the OCS areas, and the fiscal regime or tax structure that would be in effect as OCS oil and gas development occurs. There is a great deal of uncertainty as to whether oil and gas production in the OCS would occur, and if production does occur, it is even more difficult to predict the timing and magnitude of exploration, development, and production activities. This study assumes that development would occur given certain price and cost assumptions and that there will be no major regulatory impediments or delays to OCS development. As with any other large industrial development, there could also be social and environmental considerations associated with offshore oil and gas development. This study is only focused on the economic effects of OCS development.

Major Findings

The economic impacts of OCS development are described as incremental effects in relation to a baseline economic projection of the Alaska economy without OCS development. The Alaska economy and population are anticipated to continue to grow in the next 50 years given the development of the natural gas pipeline, new development in the mining sector, and modest growth in tourism, fisheries, and military and civilian federal operations. However, declining oil production from existing onshore fields is expected to pose long-term challenges to Alaska's economic and fiscal well-being. OCS development, if it were to occur, could be a significant driver of the next generation of economic activity by extending the duration of the petroleum industry in the state.

The following major findings are based on a reasonable set of exploration, development, and production scenarios for three OCS areas: (1) Beaufort Sea; (2) Chukchi Sea; and (3) North Aleutian Basin.

Job and Population Growth

- OCS development could generate an annual average of 35,000 jobs over the next 50 years—a six percent increase compared to total statewide employment without OCS development.
- These jobs represent a total payroll of $72 billion (2007$) over the 50-year period.

- OCS-related employment growth could more than offset losses from the decline of petroleum production on state lands and could help sustain the economy for several decades.
- Opportunities would be created throughout the state in both high paying, long-term, year-round jobs and in seasonal and short-term jobs. Of the 6,000 oil and gas sector jobs, about 3,900 could be long-term, year-round jobs.
- The growth in jobs resulting from OCS development could lead to a five percent increase in statewide population. Most of the growth would be concentrated in Alaska's population centers, but directly impacted regions could experience a much greater percent increase.

Table ES-1. Potential Future Employment Effects of OCS Development in Alaska

Sector	Average Annual Employment
Oil and Gas (extraction and oilfield services)	**6,000**
Infrastructure	**3,000**
Support	**22,000**
State/Local Government	**4,000**
Total:	35,000

Note: Employment is rounded and expressed in annual average, 2008 to 2057. It should be noted that it could take several years before OCS employment might reach the annual average of 6,000 direct jobs in the oil and gas sector, and for the other sectors to reach the levels noted above (see Figure ES-1 for the projected direct employment per year and Figure ES-2 for the projected employment by sector per year).

Projected Direct Revenues

The potential cumulative direct petroleum revenues to state and local governments is estimated to be $5.8 billion (2007$) with most revenues going to directly impacted local governments from property taxes on onshore petroleum facilities.

Table ES-2. Potential Cumulative Direct Revenue Effects of OCS Development to State and Local Governments, 2008 to 2057 (in Billions of 2007$)

Entity/Source of Revenue	Amount
State of Alaska	**1.4**
Property Tax	0.4
Corporate Income Tax	1.0
Shared Lease Payments	--
Directly Impacted Local Governments	**4.5**
Property Tax	4.5
Total Alaska:	**5.8**

Notes: (1) The sum of the amounts do not equal total due to rounding. (2) For this table, *Directly Impacted Local Governments* include the North Slope Borough and the Aleutians East Borough. (3) Federal lease payments shared with the state (from 8(g) leases) are estimated to be about $20 million (2007$).

Fiscal Effects

- Potential total state government revenues (under the current tax system) from OCS-related activities including direct OCS petroleum revenues, population-related revenues, and indirect petroleum revenues, are projected to be $15.3 billion (2007$) given the base case price level of approximately $65 per barrel of crude oil. As expected, given the results of the sensitivity analysis, state government stands to benefit from higher petroleum prices.
- The estimated population-related revenues would come primarily from a state personal income tax that is assumed in the baseline projection to partially offset falling petroleum revenues from declining onshore production. This is an assumption in the baseline analysis, regardless of OCS development. In the OCS case, the $72 billion (2007$) of wages and salaries augments the personal income tax.
- OCS production reduces the tariffs and other costs of onshore production, which results in an increase in state revenues from this production. These lower costs also lead to a modest increase in production onshore. Together these indirect petroleum revenues are estimated to be $10.1 billion (2007$)
- Incremental state government expenditures for providing public services to support OCS development and the associated population increase are projected to be about $8.8 billion (2007$).
- The projected net revenues to the State of Alaska could be about $6.6 billion (2007$), reflecting a positive fiscal effect of OCS development.
- At the local/regional government level, the projected growth in revenues of directly impacted communities from property taxes on onshore OCS petroleum facilities, estimated at $4.5 billion, would increase the capacity of local governments to respond to public needs generated by OCS developments.
- OCS development will be an important factor in reducing risks for the proposed natural gas pipeline from the North Slope to Lower 48 markets. The Alaska OCS has some of the largest natural gas resources in Alaska and knowledge of the potential development of these resources reduces the financial risk to the shippers that may commit to the natural gas pipeline project.

Table ES-3. Potential State Fiscal Effects of OCS Development: Cumulative Revenues and Expenditures Under Varying Price Assumptions, 2008 to 2057 (in Billions of 2007$)

	Base	Sensitivity Analysis		
Revenue/Expenditure Category	**Case**	**Case 1**	**Case 2**	**Case 3**
Projected State Revenues	**15.3**	**16.0**	**17.1**	**18.2**
Direct OCS Petroleum Revenues	1.4	1.4	1.4	1.4
Population Related Revenues	3.9	3.9	3.9	3.9
Indirect Petroleum Revenues due to OCS development				
TAPS-Fuller Pipeline Enhanced Value of North Slope Production	5.7	5.7	5.7	5.7
TAPS-Fuller Pipeline Additional North Slope Production	2.0	2.4	3.1	3.8
Gas Pipeline Tariff Reduction Effect	1.2	1.2	1.2	1.2
Incremental Production due to OCS Infrastructure	1.2	1.5	1.9	2.3
Projected Incremental State Expenditures	**(8.8)**	**(8.8)**	**(8.8)**	**(8.8)**
Projected State of Alaska Net Fiscal Balance:	**6.6**	**7.2**	**8.3**	**9.4**

Notes: (1) The sum of the amounts may not equal the total due to rounding. (2) Base case estimates are based on the Energy Information Administration's petroleum price projection with a long-term average price of $65.50 per barrel of oil and $6.40 per million Btu's of gas (in 2006$). The sensitivity analysis considers the following oil and gas price levels through 2030; prices thereafter are assumed to increase at a rate of 0.5 percent per year (same assumption as the base case):

- Case 1: Oil: $80 per barrel and Natural gas: $7.8 per mmBtu
- Case 2: Oil: $100 per barrel and Natural Gas: $9.8 per mmBtu
- Case 3: Oil: $120 per barrel and Natural Gas: $11.8 per mmBtu

The sensitivity analysis cases estimate the effects of higher petroleum prices, holding all other factors constant.

Background

Increasing petroleum prices in the past five years have renewed interest in exploring for oil and gas in Alaska's OCS areas. This is evidenced by the recent OCS lease sales in Alaska—Beaufort Lease Sale 195 was the most successful sale in the Beaufort OCS (tracts and high bids) since 1988 and Chukchi Lease Sale 193 held in February 2008, collected $2.66 billion in high bids for 488 tracts (this is the biggest lease sale onshore or offshore in Alaska's history). More lease sales are planned in the Beaufort Sea, Chukchi Sea, and the North Aleutian Basin as part of MMS's *5-Year Lease Program* for 2007-2012. Exploration drilling is already planned for leases in the Beaufort Sea, covering five prospects in the eastern Beaufort (including Sivulliq, formerly the Hammerhead discovery), and another prospect located about 20 miles north of the Colville River Delta (MMS 2007).

MMS estimates that the OCS areas of the Beaufort Sea, Chukchi Sea, and the North Aleutian Basin have undiscovered technically recoverable resources (UTRR) ranging from 2.8 to 65.8 billion barrels of oil (BBO) and 11.4 to 305 trillion cubic feet (TCF) of natural gas, depending on the likelihood of occurrence. MMS also estimates that the three OCS areas have undiscovered economically recoverable resources (UERR) ranging from 1 to 46 billion barrels of oil and 3.8 to 175.1 TCF of gas. Economically recoverable resources represent the portion of the undiscovered technically recoverable resources that can be explored, developed and commercially produced at given costs and price considerations. MMS assumed market prices of $60 per barrel of oil and $9.07 per thousand cubic feet of gas (in 2006$) for the UERR estimates of the three Alaska OCS areas.

Scenarios Considered

In order to quantify the potential effects of oil and gas development in the OCS, a set of scenarios that reflect possible industry-wide exploration, development, and production activities for each OCS area was developed.[1] Of course, this set of scenarios represents only one possible picture of the future. It is likely that different activities and timing will occur in the future, as each company operating in these basins could have unique plans for identifying and recovering the hydrocarbon resources. Furthermore, there is a high level of uncertainty regarding the volumes of oil and gas that could be commercialized in the future, as the estimated resource potential shown in the table above is not yet proven commercial reserves. It is impossible to anticipate what the actual development pattern would be, but the scenarios provide a reasonable basis to begin thinking about potential effects, particularly since they provide employment estimates consistent with historical patterns of petroleum development in the state.

The scenarios used for this study are based in part on the scenarios discussed by MMS in published Environmental Impact Statements (EIS) and other materials.[2] The scenarios include assessments of oil and gas resources,[3] expected levels of exploration activities, development of oil and gas fields and required infrastructure, and operations and maintenance activities at the assumed production levels.

These scenarios are the basis for determining the level of manpower requirements, as well as the amount of revenues that could potentially accrue to the state and local governments. Summaries of the scenarios are presented below.

Beaufort Scenario

- Exploration drilling occurs over 15 years with 1 to 3 drilling rigs per season.
- Development includes construction of seven offshore production platforms, offshore pipelines, on-shore pipelines that connect to the Trans-Alaska Pipeline System (TAPS) and a future gas pipeline, as well as new on-shore facilities.
- Production assumes first oil in 2019 and first gas in 2029, with seven fields producing a total cumulative volume of about five billion barrels of oil and seven trillion cubic feet of gas through 2057.

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[1] The Minerals Management Service, the federal agency that manages OCS areas, develops exploration, development, and production scenarios for use in their environmental assessments and environmental impact studies. The scenarios developed by MMS for these OCS areas were used as a starting point for this analysis. Major departures from the MMS assumptions/scenarios include: 1) gas production in the Beaufort and Chukchi; 2) new on-shore facilities in the Beaufort; 3) updated resource estimates using the *2006 MMS Resource Assessment*; and 4) adjustments in timing and level of exploration and development activities to reflect changes in technology and resource potential, and to incorporate insights from industry and MMS staff regarding recent experience operating in arctic conditions and in areas of greater water depths.

[2] The recent Draft Environmental Impact Statement for the *Beaufort and Chukchi Sea Planning Areas, Oil and Gas Lease Sales 209, 212, 217, and 221* was issued after the analysis for this report was completed. The scenarios used in this report are based on earlier scenarios and other material that are broader in scope and duration than the November 2008 draft EIS.

[3] The resource assessments are based on analyses of geology, development costs, and timing, as well as oil and gas prices.

Chukchi Scenario

- Exploration drilling occurs over 24 years with 1 to 2 drilling rigs per season.
- Development includes construction of four offshore production platforms, offshore pipelines, on-shore pipelines across the National Petroleum Reserve – Alaska (NPR-A) to connect to the TAPS and a future gas pipeline from the North Slope. A new shore base[4] on the Chukchi coast is assumed to be constructed to support offshore exploration and development; other on-shore facilities are also assumed to be required to support production activities.
- Production assumes first oil in 2022 and first gas in 2036, with four fields producing a total cumulative volume of 4.8 billion barrels of oil and 7.8 trillion cubic feet of gas through 2057.

North Aleutian Scenario

- Exploration drilling occurs over 5 years with 1 to 2 drilling rigs per season.
- Development includes construction of two offshore production platforms, offshore and overland pipelines, a new shore base on the north side of the Alaska Peninsula, and on the south side a marine terminal for oil, as well as a liquefied natural gas (LNG) facility and an export terminal for gas.
- Production assumes first oil in 2021 and first gas in 2022, with two fields producing a total cumulative volume of about 0.394 billion barrels of oil and 5 trillion cubic feet of gas through 2044 when production ceases.

Activity Schedule

Figure ES-1 shows a potential schedule for exploration, development, production and abandonment activities from 2008 through 2057. The figure shows the expected years for first oil and gas production under the scenarios for each basin. The first gas production in the Beaufort Sea is assumed to occur with the first expansion of the proposed natural gas pipeline in 2029, nine years after initial throughput of the gas pipeline. First gas production from the Chukchi Sea is assumed to occur in 2036 with the second expansion of the natural gas pipeline. Both of these expansions are anticipated to reduce the gas pipeline tariff.

The Beaufort scenario assumes that production would still be ongoing in 2057 when the study period ceases. The relatively late discovery and production from expected large resources in the Chukchi Sea result in no platforms being abandoned during the study period. The smaller field sizes expected in the North Aleutian Basin result in the fields ceasing production and the platforms being abandoned by 2044.

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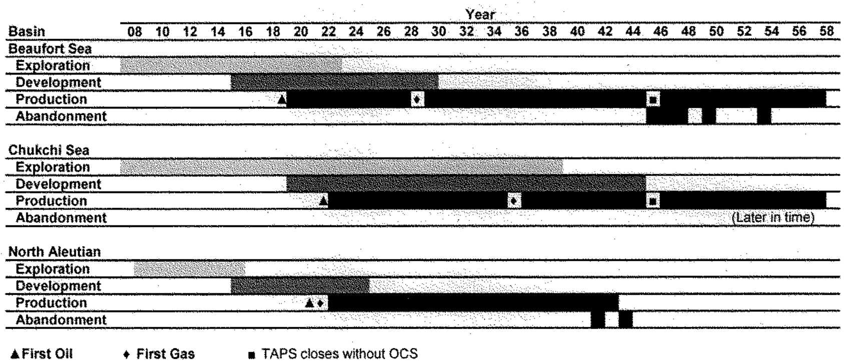
[4] A shore base is an on-shore facility that will be used for staging people and equipment during exploration, and later on to support construction and production activities. The base will likely serve as living quarters for industry workers as well as the transportation, storage, and communication hubs for all of the offshore activities.

Figure ES-1. Schedule of Activities for Beaufort, Chukchi, and North Aleutian Basins, 2008-2057



Source: Northern Economics, Inc. assumptions

Potential OCS Oil and Gas Production

Based on the MMS resource assessments and the production scenarios described above for all three OCS areas, the total OCS oil and gas that might be produced through 2057 could amount to about 10.2 billion barrels of oil and 19.8 trillion cubic feet of gas. This translates to a peak daily production from all three OCS areas equal to 1.8 million barrels of oil and 2.9 billion cubic feet (BCF) of gas. In comparison, in 2007 the total statewide daily production of oil and gas was 796,289 barrels and 8.831 BCF, respectively, although most of the gas was re-injected to maintain reservoir pressure (Division of Oil and Gas, 2007 Annual Report).

In terms of the value of this assumed level of production, 10.2 billion barrels of oil alone at $100 a barrel, would translate to over $1 trillion; at $60 per barrel, the value would be over $600 billion.

Without OCS development, the projected statewide production volumes of oil and gas (on-shore) through 2057 are 7.7 billion barrels and 54 TCF, respectively.

Potential Employment Effects

Direct Employment

Given the scenarios described above, OCS development in the Beaufort, Chukchi, and the North Aleutian could directly generate an estimated annual average employment of about 6,000 jobs over the course of 50 years (2008 to 2057). These are direct jobs[5] (both on-site and in headquarters assumed to be located in Anchorage) that are involved in exploration activities, construction of off-shore and on-shore production and transportation facilities, spill prevention, logistics, and operations and maintenance activities. The estimated 6,000 direct jobs for OCS activity represent roughly 48 percent of 2007 average annual oil and gas employment of 12,600 (ADOLWD, 2008).

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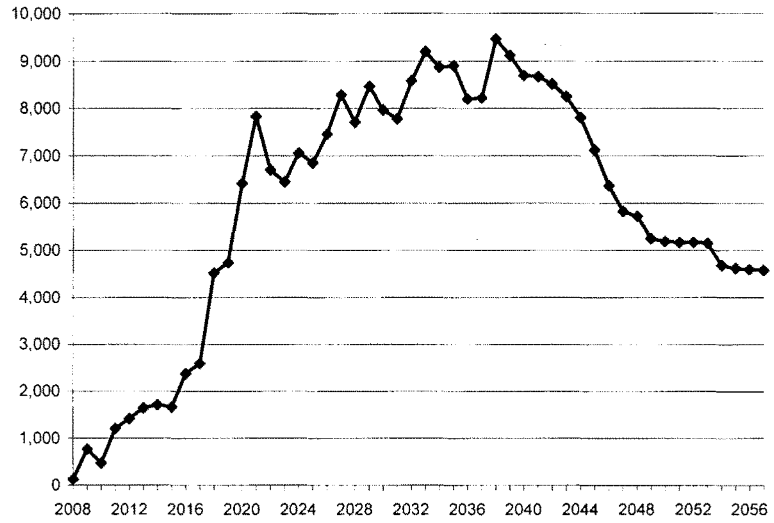
[5] These direct employment estimates do not include jobs involved in building modules outside of Alaska, but do include non-resident jobs involved in installing pre-fabricated modules at the site.

Figure ES-2 shows the potential direct annual average employment in the oil and gas industry that could result from OCS development in all three areas across time. The growth in employment in the next decade associated with OCS development could offset the decline in petroleum employment associated with the decline in oil production from state lands and maintain employment levels after the construction of the gas pipeline. Subsequently, for about 2 decades, employment could be relatively stable as fields are developed and produced over that period. Eventually, direct employment will decline as production declines and fields are abandoned. As noted earlier, this is just one possible pattern; OCS development could occur in different locations and different times and the development of multiple fields could tend to smooth out any boom and bust phenomenon.

Figure ES-2. Potential Total Direct Annual Average Employment from OCS Development in Alaska, 2008 to 2057



Source: Northern Economics Inc. estimates.

Peak employment across all OCS areas based on these development scenarios could occur in 2038 with an estimated annual average employment of 9,500; the peaking occurs when major discoveries are being developed and facility construction is underway. Table ES-4 shows the potential direct employment effects that could result from oil and gas development in each of the OCS areas. The peak employment for each OCS area occurs at different times, and the production phases are of different durations so the rows cannot be summed across to arrive at the estimates shown for all areas.

Table ES-4. Potential Direct Employment Estimates (Annual Average Employment) by OCS Area

	Beaufort	Chukchi	North Aleutian	All Areas
Annualized Average				
Entire time frame	2,800	2,500	900	6,000
Production phase	3,300	3,000	1,100	7,100
Peak Employment	4,800	4,200	2,200	9,500
Year of Peak Employment	*2027*	*2038*	*2018*	*2038*

Source: Northern Economics Inc. estimates.

The job estimates are expressed in annual average employment, but there would be opportunities for both year-round and seasonal or short-term jobs. As noted earlier, of the 6,000 direct oil and gas industry jobs, about 3,900 could be high paying year-round jobs. The current average annual wage in the oil and gas sector is $108,538—which is more than double the statewide annual average of $43,524.

Seasonal and short-term job opportunities include those associated with oil spill response operations, equipment operations, construction of support facilities, marine mammal observer program, camp support, seismic survey, etc. The number of persons that might be employed for short-term or seasonal jobs could be greater than the number of year-round jobs.

Indirect and Induced Employment

Besides the direct jobs in the oil and gas sector, jobs would be created in other sectors of the economy; these jobs are referred to as indirect and induced jobs. These jobs are generated as a result of the multiplier effects of in-state spending—industry purchases from other Alaska businesses, government spending of OCS-related revenues, and household spending of wages and salaries. The potential employment effects of OCS development by sector are shown in Figure ES-3.

The large number of indirect and induced employment[6] associated with OCS development is attributable to the following:

- Potential large in-state purchases of goods and services by the businesses directly engaged in exploration, development, and production
- High wages of the oil and gas industry
- Significant revenues paid by the industry to state and local governments

Although direct oil and gas employment would taper off as OCS production declines, total employment could remain high due to the effects on the rest of the economy from the economic expansion associated with OCS development. These effects include increased public and private wealth, the expansion of in-state businesses offering goods and services to other Alaska businesses and households, expansion of local markets creating more competition and lower costs, and enhanced economic stability from reduced seasonality.

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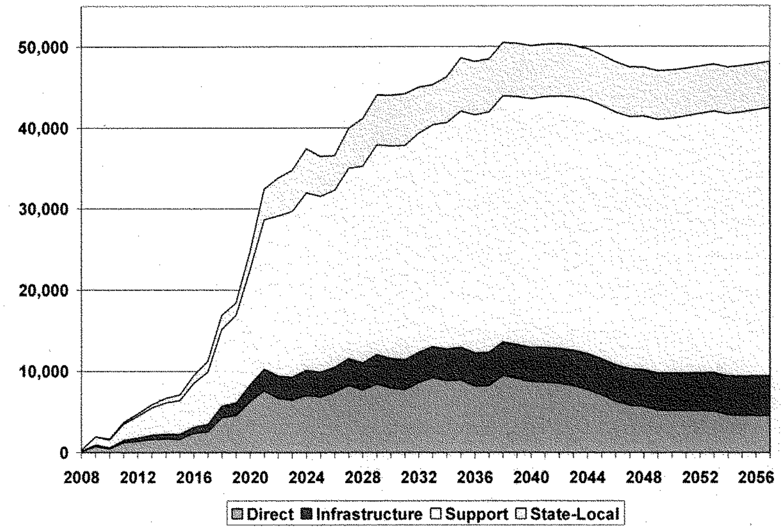
[6] The ratio of total to direct OCS employment, commonly referred to as the employment multiplier, is approximately 5.9 over the entire period, a level consistent with historical oil and gas activities in the state. If the ratio is calculated as total divided by direct plus government employment, since Alaska government employment is driven by oil revenues, the multiplier is 3.4.

It is estimated that total annual average employment from OCS development—including all the direct, indirect, and induced employment—could be about 35,000 per year on average through 2057, with a peak employment of over 50,000 in 2038. Total wages and salaries associated with OCS development over the 50-year period are estimated to be about $72 billion (2007$).

Figure ES-3. Potential Total Employment Effects from OCS Development by Category



Source: Northern Economics, Inc. and ISER estimates.

As shown earlier in Table ES-1, 35,000 direct, indirect, and induced jobs could be created in different sectors of the economy. The majority of the total employment, about 22,000, would be in the support sector, which includes trade, services, and other related businesses. These businesses provide goods and services to other Alaska businesses as well as Alaska households. Projected infrastructure employment consists of about 3,000 workers in the transportation, communications, public utilities, and business services sectors that work closely with the petroleum industry. State/local government employment includes all the public sector jobs; OCS development is estimated to generate 4,000 public sector jobs.

Employment by Place of Work and by Place of Residence

Based on history, workers will come from throughout the state and elsewhere to take the on-site jobs. Given the current distribution of North Slope oil and gas industry workers around the state, it is anticipated that residents of Anchorage, Kenai, and the Matanuska-Susitna (Mat-Su) Borough could capture a large share of the potential employment. The opportunity exists for rural residents of the state, particularly residents of the North Slope Borough and other areas in proximity to the three OCS areas, to capture a larger share of these jobs than shown in Table ES-5, which is based on past employment data. Table ES-5 shows the incremental increase in annual average employment by place of work and by place of residence resulting from the development scenarios in all three OCS areas.

Table ES-5. Estimated Annual Average Employment Generated from Potential OCS Development by Place of Work and by Place of Residence

	Direct		Total Employment Direct + Indirect + Induced	
Place	**Place of Work**	**Place of Residence**	**Place of Work**	**Place of Residence**
Anchorage	800	2,500	15,000	16,000
Mat-Su Borough	--	500	3,000	3,000
Kenai Peninsula Borough	--	500	2,000	3,000
Fairbanks North Star Borough	<100	250	3,000	3,000
Aleutians East and West	600	100	1,000	1,000
North Slope Borough	4,500	<100	6,000	2,000
Balance of State	--	<100	5,000	5,000
Outside Alaska	--	2,000	--	2,000
Total	6,000	6,000	35,000	35,000

Source: Northern Economics and ISER estimates. Distribution of workers by place of residence is based on Alaska Department of Labor and Workforce Development data.

Direct Petroleum Revenues

Federal, state, and local governments could directly benefit from offshore oil and gas development with three potential streams of revenues—property tax revenues, corporate income tax revenues, and revenues from OCS leases. The estimated incremental revenues from OCS development accruing to the state and local governments are shown in Table ES-6.

Table ES-6. Summary of Potential Cumulative Direct Revenues to the State and Local Governments, 2008 to 2057 (in Billions of 2007$)

Entity	Amount
State of Alaska	**1.4**
Property Tax	0.4
Corporate Income Tax	1.0
Shared Lease Payments	--
Impacted Local Governments	**4.5**
North Slope Borough	
Property Tax	3.5
Aleutians East Borough	
Property Tax[7]	1.0
Total Alaska:	**5.8**

Source: Northern Economics Inc. and ISER MAP model estimates.

Notes:
(1) The sum of the amounts may not equal the total due to rounding.
(2) The potential revenue effects shown above reflect the base case analysis that is based on the Energy Information Administration's price projection; a relatively conservative long-term average price of about $65.50 per barrel of oil and $6.40 per million Btu's of gas (in 2006 dollars).

Property taxes would primarily be generated from the new onshore facilities that could be built to support the offshore operations of the industry. The state collects a property tax on oil and gas related facilities within its boundaries, which it shares with local political jurisdictions where those facilities are located, if the local government chooses to impose a property tax.

The state also imposes a corporate income tax on petroleum activity within the state.[8] The federal government collects revenues from bonus bids, rental payments, and royalty payments from the offshore activity. A portion of these federal revenues is shared with the state, which in turn may distribute a portion to some local governments.

Given the current OCS revenue sharing system in Alaska, all lease revenues from OCS areas directly accrue to the federal government except for a portion of revenues from leases in the 8(g) zone[9] and funds allocated through the Coastal Impact Assistance Program (CIAP) that are shared with the state and coastal political subdivisions. Under the current system, Alaska would receive a 27 percent share of OCS lease revenues from the 8(g) zone and a share of the CIAP Funds that are allocated among different producing states based on a formula. The CIAP funds however are temporary and may not be available after federal fiscal year 2010. It should be noted that lease sales in 2007 and 2008 are expected to generate a significant increase in CIAP funds to Alaska, especially given the successful Chukchi lease sale held in 2008.[10] In the OCS development scenarios developed for this study, the Beaufort Sea would be the only OCS area with 8(g) producing leases.

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[7] For this analysis, the potential revenue benefits accrue to the North Slope Borough (NSB) and the Aleutians East Borough (AEB), assuming that all support base, production, and transportation facilities would be built within the geographic jurisdiction of these two Boroughs. It is of course possible that industry would choose to locate some facilities in other areas such as the Northwest Arctic Borough or the Lake and Peninsula Borough, or the City of Unalaska. Also, it is assumed that the Aleutians East Borough would ultimately levy a property tax similar to the North Slope Borough. Again, the findings presented here are contingent on the assumptions about likely development and production activities as described in the scenarios for each OCS area.

[8] A share of world income is attributed to Alaska based upon the share of property, sales, and extraction within the state.

[9] This three-mile wide band extends from the 3-nautical mile state-federal demarcation line seaward to 6-nautical miles offshore.

Without a change in the current revenue sharing arrangement, the state and local governments are expected to receive direct revenues from OCS development of about $5.8 billion (2007$)—mostly from leases located between three nautical miles to six nautical miles offshore (referred to as the 8(g) zone), a share of the Coastal Impact Assistance Program (CIAP) funds, which is due to sunset in 2010, and taxes on corporate income and on-shore properties.

Potential State Population and State Fiscal Effects

The new jobs generated by OCS development could lead to an increase in statewide population that averages 49,000 over the projection period—about five percent higher than projected population without OCS activity. The population increase would consist mostly of families, including infants, children, and seniors, although the majority of new Alaskans would be working age adults.

The population increase would place new demands on state government, which funds the majority of public services in Alaska either directly or through transfers to local governments. The most important state-provided public services sensitive to population are education, health and social services, corrections, the University of Alaska, transportation, and public safety.

The cost of OCS development to state government would consist of the cost of providing services to the new population as noted above (estimated at $8.6 billion) as well as the cost of administering OCS programs (estimated at $0.2 billion). In total, the incremental cost to the state of Alaska from OCS development is estimated to be $8.8 billion (2007$).

Total direct and indirect revenues generated by the OCS development scenarios presented here could amount to $15.3 billion (2007$), which could pay for the new public services as well as produce a revenue surplus that could be used by the state for any purpose. Total revenues would include the direct OCS petroleum revenues, plus general tax revenues of $3.9 billion and spinoff or indirect revenues from other petroleum activity of $10.1 billion.

The general tax revenues would come primarily from income taxes paid by the new workers. In the baseline projection (without OCS development), there is a fiscal assumption of a state personal income tax based on the fact that revenues from existing sources are projected to decline in future years, thus requiring new sources of revenues to fund the state budget. To be consistent with that no-OCS assumption, it is assumed that the state government utilizes the potential of the $72 billion (2007$) of wages and salaries generated by OCS activity to help to pay for the new public services.

Indirect or spinoff revenues from other petroleum activity are difficult to quantify, but the history of development at Prudhoe Bay demonstrates their importance. Four sources of indirect revenues are identified that arise from the lower cost of petroleum production and transportation generated by OCS development (Table ES-3 summarizes the estimated indirect revenues from each source):

- It is estimated that $5.7 billion (2007$) in additional revenues to the state could be collected on non-OCS oil production due to the increase in TAPS throughput with OCS oil from the Beaufort and Chukchi Seas. If OCS oil is transported through TAPS, the higher volume of throughput would reduce the TAPS tariff and would extend the life of TAPS. The associated reduction in tariff would in turn raise the wellhead price of North Slope oil. An increase in the wellhead price would increase the tax base and revenues from the state production tax and corporate income tax and also increase state royalties. And, in the absence of OCS oil throughput, TAPS is anticipated to shut down when it reaches the minimum technically viable level of daily throughput—estimated at 200,000 barrels per day—which could be reached in 2046. Because this shut down would leave oil worth billions stranded on the North Slope, some alternative to move the oil to market could be deployed. It is assumed that a marine transport system would be used to move the remaining oil to market at an estimated cost of $15 per barrel ($2007).

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[10] Due to an increase in OCS revenues generated by the recent Chukchi Lease Sale 193, MMS has estimated that the state of Alaska's annual CIAP allocation will increase from approximately $2.5 million in 2007 and 2008 to be between $29 million and $41.2 million for 2009 and 2010.

- A higher wellhead value resulting from higher TAPS pipeline throughput because of OCS oil is also anticipated to have a stimulating effect on exploration and development of North Slope reserves. The average increase in wellhead value due to higher TAPS throughput is estimated to be six percent. The effect would be similar to an increase in industry activity due to higher oil prices or a reduction in taxes. Based on studies of the sensitivity of North Slope production to the price of oil, as well as observations that higher prices stimulate the development of satellite fields (smaller accumulations of oil that are adjacent to larger fields), it is estimated that this stimulating effect could result in an increase in oil production equal to 141 million barrels over the projection period. This could translate to an increase in state revenues of about $2 billion.
- The addition of OCS natural gas to throughput of the pipeline moving North Slope gas to market is estimated to increase state revenues by $1.2 billion. Although the pipeline capacity would need to be expanded to accommodate this additional throughput, expansion could be done at a cost that would reduce the tariff on all the gas moving through the line. Like the reduced oil pipeline tariff, this would raise the wellhead value of the gas and increase state revenues from the production and income taxes as well as royalties.
- Finally, the presence of additional petroleum infrastructure and its geographic distribution suggests that there could be opportunities for the development of fields that are in close geographic proximity to OCS infrastructure or that could share OCS facilities that would not be developed without those advantages. An expanded support industry due to OCS developments could also be the source of cost savings that could make some marginal fields economically attractive. The potential production and revenues from these latter effects could be very large indeed, but they are virtually impossible to quantify. However, to demonstrate the potential magnitude of these effects on state revenues, it was assumed that cumulative North Slope production is increased by two percent—87 million barrels—as a result of these effects. This could generate $1.2 billion (2007$) in additional state revenues from production and corporate income taxes and royalty payments to the state.

In addition to the benefits noted above, the potential for OCS development will be an important factor in reducing risks for the proposed natural gas pipeline from the North Slope to Lower 48 markets. At this time, there are not sufficient gas reserves to operate the gas pipeline for the 20 to 25 years that will be necessary to finance the pipeline; the natural gas shippers who must commit to moving gas in the pipeline for that period of time will need confidence that other natural gas resources can be found, and studies by the Minerals Management Service and others indicate that the OCS has some of the largest natural gas resources in Alaska. Knowledge of this potential resource reduces the financial risk to the shippers that commit to the natural gas pipeline project.

Local/Regional Population and Fiscal Effects

Local economic impacts will be most significant in the regions adjacent to the basins where OCS activity occurs. As noted earlier, onsite employment in the North Slope Borough could average 45 percent higher with OCS development, while employment in the Aleutians region could be 11 percent higher. Although the percent increases in resident employment and population could be less than the increase in onsite employment, the increases in population as well as other local requirements to deal with the costs associated with development could require considerable new local revenues.

The OCS revenues that flow to the directly impacted regions would come primarily from a share of the state property tax based on the value of petroleum facilities onshore in their region. Under the fiscal regime, where no federal lease revenues are shared with the state and local governments, directly impacted local governments would rely on the property tax to pay for government services. The estimated cumulative OCS-related property tax revenues to the North Slope Borough could be $3.5 billion. This could be in addition to an estimated $7 billion over that same period without OCS development. The OCS revenues could serve to offset the decline in revenues associated with falling onshore oil production. The estimated cumulative OCS-related property tax revenues available to the Aleutians region could be $1 billion. Currently, the tax base of that region is quite modest and so the OCS development would represent a large increase in potential revenue generating capacity.

Given these estimates, directly impacted local governments could have sufficient revenues from property taxes to cover any costs associated with OCS development. However, their ability to adequately fund public services ultimately depends on the specific public costs associated with OCS. Greater sharing of federal lease revenues with the state and local governments, higher prices, and higher production all make it more likely that local costs can be fully offset by OCS revenues.

Much of the population impact from OCS development would be outside the directly impacted regions, and local governments throughout the state would be faced with additional costs associated with that additional population. Most of the population impact would be in urban Alaska where the existing tax base, primarily a combination of local sales and property taxes, is responsive to population growth. Based on the assumptions outlined in this study, the expanded state fiscal capacity (under the OCS development scenarios presented here) should be sufficient to cover these costs.

Finally, as with any other large industrial development, there could be social and environmental effects associated with offshore oil and gas development, and industry as well as state and local governments should continue efforts in developing and implementing programs or regulations designed to mitigate the potential effects of oil and gas development on the environment and social institutions.

1 Introduction

Shell Exploration & Production (Shell) contracted with Northern Economics, Inc. and the Institute of Social and Economic Research, University of Alaska Anchorage (ISER) to analyze economic effects that could accrue to the State of Alaska and affected boroughs and communities from development activities in three outer continental shelf (OCS) areas of Alaska:

1) The Beaufort Sea;
2) The Chukchi Sea; and
3) The North Aleutian Basin.

This study quantifies the potential economic benefits of the petroleum industry's future exploration, development, and production activities in terms of jobs and government revenues, as well as the associated population and fiscal effects on the state.

The first step in the analysis involved developing scenarios, or possible futures, that reflect possible industry-wide exploration, development, and production activities in each of the three Alaska OCS areas. The scenarios include assessments of oil and gas resources, expected levels of exploration activities such as seismic surveys and exploratory drilling, development of oil and gas fields, and required infrastructure, production volumes, and operations and maintenance activities given assumed production levels. These scenarios are the basis for determining the level of manpower requirements, as well as the amount of tax revenues and royalty payments that could potentially accrue to the State of Alaska and local governments. Section 3 of this report discusses in detail the scenarios for OCS development in the Beaufort Sea, Chukchi Sea, and North Aleutian Basin.

The next step involved estimating the direct effects associated with the oil and gas development scenario for each of the OCS areas. To estimate the direct employment and revenues, the *Economic Impact Model for Petroleum Activities in Alaska* (IMPAK model), which was originally developed for the Minerals Management Service (MMS), was modified for use in this study. The model provided information on input requirements, particularly manpower requirements, for exploration, development, and production activities that are specific to offshore oil and gas development. The model was significantly modified to reflect the OCS development scenarios developed in this study, more current technologies, offshore infrastructure that is more suitable for arctic conditions and greater water depths, and additional onshore infrastructure. A separate model was developed to capture different state and local tax mechanisms and adding local property tax payments. Outputs of direct annual employment in the oil and gas industry, and annual revenues from OCS activity were inputs for a second model. Section 4 of this report discusses the direct employment and revenue estimates for each of the OCS areas.

The third step involved estimating the secondary effects (or the indirect and induced effects) of OCS activities on a statewide and a regional level using the *Man in the Arctic Program* (MAP) model developed by ISER. The MAP model is an econometric model of the Alaska economy designed to analyze the economic, fiscal, and demographic effects of oil and gas development on the state and its regions. It was originally developed by ISER in the 1970s and has been continuously refined and updated for use in determining future effects of many different types of real and potential economic development activity. The model has also been the basis for several MMS studies of oil and gas development. The results of the MAP model and a discussion of the secondary effects (including state and local fiscal effects) of oil and gas development in each of the OCS areas are presented in Section 4.

Finally, a sensitivity analysis was conducted to look at the economic effects, particularly the revenue effects, under higher oil and gas price assumptions. The results of the sensitivity analysis are presented in Section 5 of this report.

2 Background Information and Assumptions

To provide context for the economic analysis, a brief review of the OCS Oil and Gas Leasing Program and general assumptions about the future of the economy of Alaska are discussed in this section. These assumptions about the economy are used in the MAP model as the baseline assumptions without OCS development—the baseline against which the economic effects of OCS development are compared.

In the early 1980s active leasing and exploration in the Alaska Outer Continental Shelf (OCS) was driven by rapidly increasing crude oil prices and access to new, high potential areas. However, after some disappointing failures (Mukluk) and declining oil prices in 1986, the industry retreated from the Alaska OCS and focused on lower risk projects elsewhere. Increasing petroleum prices and acreage availability in the past five years have created renewed interest in exploring for oil and gas in Alaska OCS areas. The Minerals Management Service's (MMS) Beaufort Lease Sale 195 was the most successful (tracts and high bids) Beaufort Sale since 1988. The MMS Chukchi Lease Sale 193 held in February 2008, collected $2.66 billion in high bids for 488 tracts. Sale 193 was the biggest lease sale (onshore or offshore) in Alaska's history. More lease sales are planned in the Beaufort Sea, Chukchi Sea, and the North Aleutian Basin as part of MMS's *5-Year Lease Plan* for the 2007-2012 period.

2.1 OCS Oil and Gas Leasing Program 2007-2012

The Secretary of the Interior approved the OCS Oil and Gas leasing program (Five-Year Program) for 2007-2012 on July 1, 2007. The Beaufort Sea, Chukchi Sea, and North Aleutian Basin are 3 of the 26 planning areas covered by the Five-Year Program. The lease sale schedule for the current Five-Year Program is shown along with the previous Five-Year Program in Table 1. The current Five-Year Program includes one planned lease sale in Cook Inlet, but Cook Inlet is outside the geographic scope of this analysis.

Table 1. MMS Lease Sale Schedule for Alaska Planning Areas

Sale Location and Number	Year Scheduled
Current 5-Year Program (2007-2012)	
Chukchi Sea Sale 193*	2008
Beaufort Sea Sale 209	2009
Cook Inlet Sale 211	2009
Chukchi Sea Sale 212	2010
Beaufort Sea Sale 217	2011
North Aleutian Basin Sale 214	2011
Chukchi Sea Sale 221	2012
Previous 5-Year Program (2002-2007)	**Month/Year Held**
Beaufort Sea Sale 202*	April 2007
Cook Inlet Sale 199	May 2006
Beaufort Sea Sale 195*	March 2005
Chukchi Sea/Hope Basin Sale 193	2004 (delayed to 2008)
Cook Inlet Sale 191*	May 2004**
Norton Basin Sale 188	September 2004
Beaufort Sea Sale 186*	September 2003

Sources: Minerals Management Service. Alaska Lease Sales Schedule. http://www.mms.gov/1d/AKsales.htm. and Proposed Final Outer Continental Shelf Oil & Gas Leasing Program 2002-2007, http://www.mms.gov/itd/pubs/NoNumbers/Proposed%20Final%202002-2007.pdf

Note: * denotes sale held. ** denotes no bids received.

2.2 Assumptions and Projections about the Future Economy of the State of Alaska

The economic effects that could accrue to the State of Alaska and affected boroughs and communities from development activities in the outer continental shelf (OCS) of Alaska are contingent upon the underlying economic and demographic conditions that will exist at the time of those development activities. Although it is impossible to know exactly what the Alaska economy will look like during the next 50 or more years, an underlying economic and demographic projection that represents a set of reasonably foreseeable conditions can be developed.

The MAP model developed by ISER is used in this analysis. The MAP model is an economic and demographic projection model. This model projects annual state and regional population, employment, fiscal activity and other variables based on assumptions about future activity of the basic industries of the economy as well as other conditions presumed to influence the economy in future years. This model has been used extensively in past MMS studies of the economic and demographic effects of OCS development in Alaska, and is continuously revised and updated to incorporate new information about the economy and population as it becomes available.

The assumptions about future basic industry activity and other economic conditions that produce the projections are summarized in this section. Using the model with different sets of reasonably foreseeable conditions allows the sensitivity of the effects of OCS development to variations in those conditions to be examined. Since the focus of the analysis is on the economic effects of OCS development, a single underlying economic and demographic projection is presented. Additional sets of assumptions were developed to conduct sensitivity analyses.

The core of the model is a set of assumptions about future conditions for Alaska's basic industries—in particular petroleum, mining, seafood, tourism, military, and civilian federal operations. The level and characteristics of activity in these industries will largely determine the rate of growth of the economy as well as its characteristics. Continued strength in the petroleum, mining, and tourism sectors as well as stability in seafood, military, and civilian federal operations are assumed.

The long term assumptions about petroleum price are based upon the most recent projections from the 2008 Annual Energy Outlook of the Energy Information Administration of the US Department of Energy. The report projects the price of crude oil to fall in a range between $56 and $83 per barrel (2006$) and the price of gas to fall in a range between $5.8 and $7.4 per mmBtu (2006$) through 2030. Beyond that time a growth rate of 0.5 percent per annum (in real $) is assumed.

The projection of Alaska crude oil production is taken from the Alaska Department of Natural Resources through 2026. Thereafter it is projected to decline at an annual rate of 4 percent. Based on these assumptions, cumulative production between 2007 and 2057 is projected to be 7.7 billion barrels.

The projection of Alaska natural gas production assumes a rate of 4.5 BCF per day beginning in 2020 and continuing through 2057, resulting in a projected cumulative production of over 62 TCF through 2057.

No petroleum activity is assumed for ANWR and in the absence of OCS activity, petroleum employment peaks in 2021 and slowly declines as oil production falls off even as gas production remains constant. Furthermore, the existing Trans-Alaska Pipeline System (TAPS) is anticipated to shut down when it reaches its minimum technically viable level of daily throughput (estimated at 200,000 barrels per day) which could be reached in 2046. It is assumed that a marine transport system would be used to move the remaining oil to market. A natural gas pipeline from Alaska's North Slope to the Midwest is assumed to be completed in 2020. The current tax and royalty regime is the basis for projecting future state and local revenues from oil and gas activities.

Mining activity in Alaska is projected to expand with the addition of several world-scale projects including the Donlin Creek and Pebble mine prospects. Tourism continues to grow consistent with its historical pattern of expansion. International air cargo operations and the growing population of retirees also contribute to an increase in jobs and income for the state in future years.

Also consistent with past performance, it is anticipated that military spending, seafood harvesting and processing, and federal civilian operations will continue to be important contributors to the economy but will not drive growth in the future.

Employment, income, and population will continue to expand based upon the growth and continued strength in these industrial sectors with most of the growth concentrated in Southcentral Alaska. In contrast, growth of the smaller outlying regions of the state will be slower.

State revenues will continue to be highly dependent upon petroleum, including natural gas in the future, but declining production will gradually erode the ability of the state to finance the state budget entirely from current sources. When that occurs, the fiscal structure of the state government will adjust. Growth in state expenditures will slow as real per capita state expenditures trend downward towards the historical average. A personal income tax, similar in form to the one eliminated in 1980, will be re-imposed. In addition, the portion of the earnings of the permanent fund allocated to the annual dividend will be reduced and a share of the annual earnings will be appropriated to support state spending. The composition of goods and services provided by state and local governments will continue to be the same as today. However, it is expected that the level of support provided from federal sources will decline as entitlements consume an increasing share of the federal budget.

3 OCS Exploration, Development, and Production Scenarios

The OCS development scenarios were developed based in part on previous reports prepared by the Minerals Management Service (MMS), as well as on insights provided by industry, MMS staff, and state and local government staff. MMS has developed exploration, development, and production scenarios for environmental impact statements and environmental assessments associated with their lease sales. These MMS scenarios were used as a starting point in developing the scenarios for this study, but modifications were made in light of more recent information regarding resource assessments, petroleum prices, technology, and the prospect of a gas pipeline project in Alaska. When the EIS was written for the Chukchi Sea Lease Sale 193, MMS did not consider construction of a natural gas pipeline on the North Slope as a "reasonably foreseeable event" and as a result, MMS did not include development of natural gas in their evaluation. Construction and operation of a gas pipeline however, is a major base case assumption in this analysis and therefore, natural gas is assumed to be an economically viable resource in the Chukchi Sea and the Beaufort Sea. This study also assumes more current petroleum price projections provided by the Energy Information Administration (EIA). Furthermore, this analysis considered the most current MMS resource assessment for Alaska OCS areas. In preparation for the 2007-2012 Five-Year Program, MMS revised its assessments of the undiscovered oil and gas resource potential of the Alaska Outer Continental Shelf[11]. The 2006 resource assessment was used as the basis for the development and production scenarios in this study.

Table 2 summarizes this study's major assumptions in the scenarios for the Beaufort Sea, Chukchi Sea, and the North Aleutian Basin. The exploration, development, and production scenarios represent one of many possible ways that OCS development in Alaska might occur. A great deal of uncertainty exists about the specific location and timing of future exploration and development activities, oil and gas production volumes, and future prices of oil and gas products. Therefore, it is important to note that future OCS development will not occur in the exact manner described for the next 50 years in these OCS development scenarios. However, in attempting to estimate the magnitude of the economic effects of OCS development, it is necessary to describe a reasonable possible future.

The next sections of this report describe the scenarios for the Beaufort Sea, Chukchi Sea, and North Aleutian Basin, respectively. Each scenario includes a discussion of the size and location of each lease sale, estimates of available resources, descriptions of the facilities and activities required to develop the resources in that location, oil and gas production volumes, specification of transportation options, and location of onshore support bases. These resource estimates and other information in the scenarios feed into the manpower model (IMPAK) and a revenue model and the outputs from these models—direct employment and revenue effects—feed into the MAP (Man-in-the-Arctic Program) model that generates the economic impact findings.

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[11] These assessments can be found in the MMS document entitled *the Alaska OCS, Undiscovered Oil and Gas Resources, Alaska Federal Offshore as of 2006.*

Table 2. Summary of OCS Development Scenarios

	Beaufort	Chukchi	North Aleutian	Total
Resource Size (Mean)				
Oil and condensates (billion barrels)	5.97	8.38	0.71	15.06
Gas (trillion cubic feet)	15.94	34.43	7.65	58.02
Exploration				
Exploration/Delineation Wells	47	43	10	100
Exploration Rig Seasons	31	27	8	66
Development				
No. of offshore production platforms	7	4	2	13
Offshore/Onshore pipelines (miles)	235	680	300	1,215
Shore bases / facilities				
Marine terminal	*yes*	*yes*	*yes*	
Liquefied Natural Gas (LNG) facility	*no*	*no*	*yes*	
Production facility	*yes*	*yes*	*yes*	
Support base	*yes*	*yes*	*yes*	
Production				
Year 1st oil flows	2019	2022	2021	
Year 1st gas flows	2029	2036	2022	
No. of producing fields	7	4	2	13
Total cumulative volume produced (through 2057)				
Oil & gas (billion barrels of oil equivalent)	6.34	6.16	1.29	13.69
Oil & condensates (billion barrels)	5.10	4.79	0.39	10.18
Gas (trillion cubic feet)	6.96	7.78	5.08	19.82
Daily peak production				
Oil & condensates (barrels per day)	1,165,707	565,472	105,074	
Gas (million cubic feet per day)	883	1,421	661	

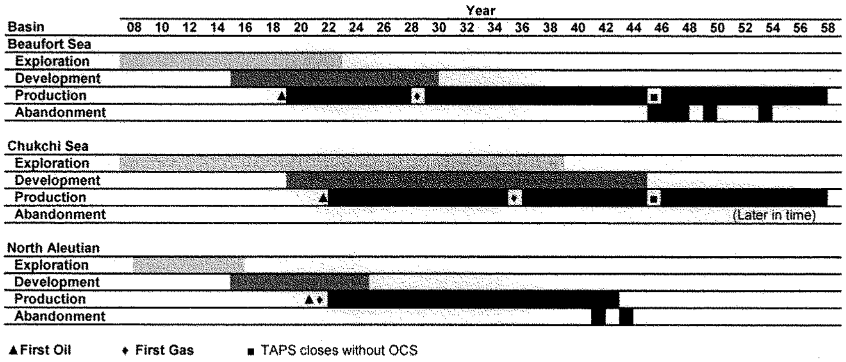
Note: The resource size estimates are from the 2006 MMS Resource Assessment. The numbers shown in the table are the mean undiscovered economically recoverable resource estimates (UERR) assuming resource commodity prices of $60 per barrel of oil and $9.07 per thousand cubic feet of natural gas.

Activity Schedule

Figure 1 shows a potential schedule for exploration, development, production and abandonment activities from 2008 through 2057. The figure shows the expected years for first oil and gas production under the scenarios for each basin. The first gas production in the Beaufort Sea is assumed to occur with the first expansion of the proposed natural gas pipeline in 2029, nine years after initial throughput of the gas pipeline. First gas production from the Chukchi Sea is assumed to occur in 2036 with the second expansion of the natural gas pipeline. Both of these expansions are anticipated to reduce the gas pipeline tariff.

The Beaufort scenario assumes that production would still be ongoing in 2057 when the study period ceases. The relatively late discovery and production from expected large resources in the Chukchi Sea result in no platforms being abandoned during the study period. The smaller field sizes expected in the North Aleutian Basin result in the fields ceasing production and the platforms being abandoned by 2044.

Figure 1. Schedule of Activities for Beaufort, Chukchi, and North Aleutian Basins, 2008-2057



Source: Northern Economics, Inc. assumptions

3.1 Beaufort Sea Scenario

MMS has held numerous lease sales for this planning area and two more are expected during the 2007-2012 planning period. Beaufort Sea Lease Sale 209 is scheduled for 2009 and Sale 217 for 2011. MMS conducted Beaufort Sea Lease Sales 186, 195, and 202 as part of its 2002-2007 Five-Year Program and additional sales are included in the 2007-2012 Five-Year Program. The most recent sale was held in April 2007 and was the most successful Beaufort Sea Sale in 17 years. Because of all this activity, numerous planning and other types of documents were available to help develop a scenario for the Beaufort. Information regarding Shell Oil's exploration plan for 2007 to 2009 was also publicly available, as the company had plans to drill during the 2007 open water season.

MMS developed several scenarios for the environmental impacts analysis of the 202 lease sale. MMS based their scenarios on professional judgments about the petroleum resource potential of the area, available technology for offshore development, and historical trends in the oil and gas industry. The MMS scenarios assumed concurrent activities in the Beaufort Sea and the National Petroleum Reserve-Alaska (NPR-A). The scenario presented here for the Beaufort Sea is based in part on MMS's exploration and development scenarios. However, as mentioned previously, this study adopted a number of assumptions that are different from the MMS scenarios. Some of the major modifications in the scenarios adopted in this study include:

1) Production timing—recent setbacks in exploration activities in the Beaufort OCS and feedback from industry indicated that it would be more realistic to assume a delay in production from the Beaufort; this study therefore assumes a longer lag between exploration and first production, with first oil flowing in 2019 rather than 2014 as assumed in the MMS scenarios for the Beaufort.
2) Resource assessment—this study uses the MMS 2006 resource assessment; this updated resource assessment shows higher recoverable resource estimates in the Beaufort Planning area. This study assumes higher production volumes than what were assumed in the MMS scenarios.

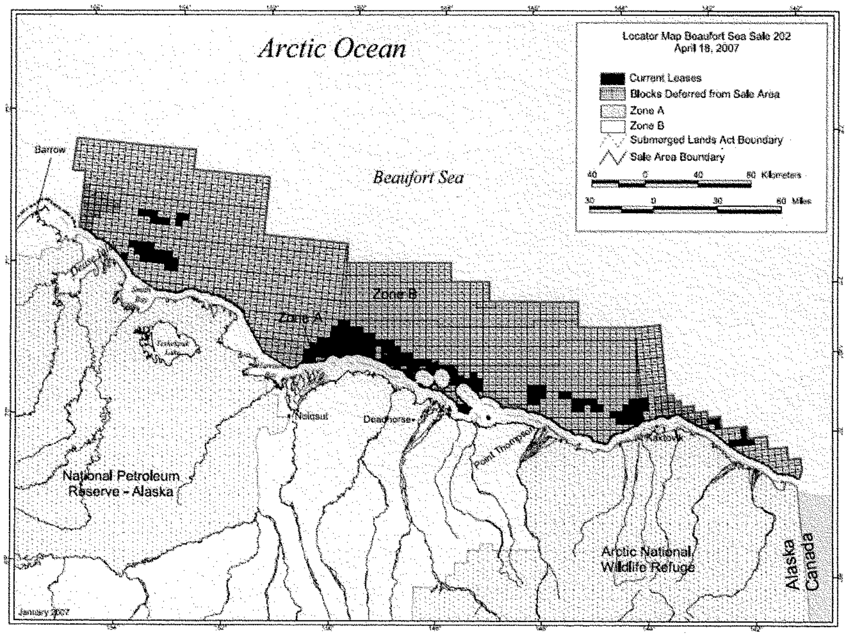
3) Gas production—as noted earlier, this study assumes that a gas pipeline to transport North Slope gas to markets outside of Alaska is going to be operational by 2020. This study assumes gas production from the Beaufort OCS.
4) Onshore facilities—the MMS scenarios assumed that existing infrastructure in the North Slope would be utilized to support production from the Beaufort OCS; this study however assumes that new onshore infrastructure would be required to support the higher volumes of oil and gas production from the Beaufort OCS.

The following subsections discuss the Beaufort Sea scenario in more detail.

3.1.1 Size and Location of Program Area

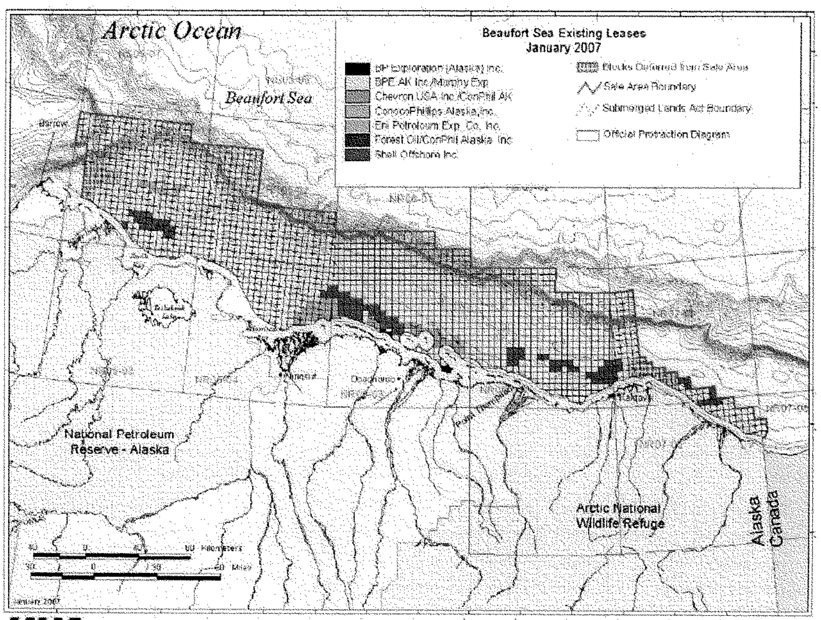
Figure 2 shows the Beaufort Sea Lease Sale 202 lease areas and the blocks deferred from the sale area, while Figure 3 shows leases in program area as of January 2007.

Figure 2. Program Area, Beaufort Sea, Lease Sale 202



Source: MMS
http://www.mms.gov/alaska/cproject/beaufortsale/Sale202/FNOS/Locator%20Map%20Sale%20202.pdf

Figure 3. Beaufort Sea Existing Leases as of January 2007


Arctic Ocean
Beaufort Sea
Barrow
Beaufort Sea Existing Leases
January 2007
BP Exploration (Alaska) Inc.
BPE AK Inc./Murphy Exp
Chevron USA Inc./ConPhil AK
ConocoPhillips Alaska, Inc.
Eni Petroleum Exp. Co. Inc.
Forest Oil/ConPhil Alaska Inc
Shell Offshore Inc.
Blocks Deferred from Sale Area
Sale Area Boundary
Submerged Lands Act Boundary
Official Protraction Diagram
National Petroleum Reserve - Alaska
Arctic National Wildlife Refuge
Alaska
Canada
Kilometers
Miles
January 2007

MMS

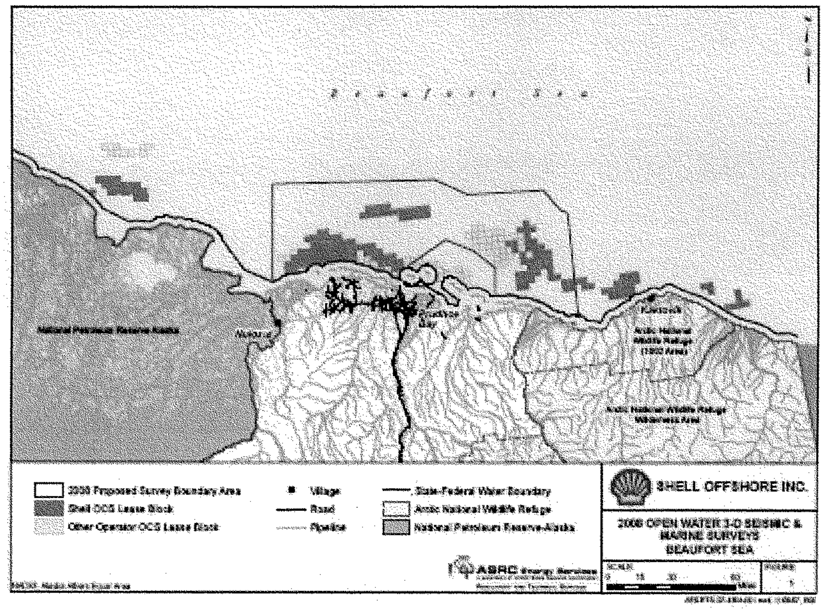
Source: MMS http://www.mms.gov/alaska/cproject/beaufortsale/Sale202/bf_leases.pdf

In addition to the leases appearing in the above map, oil companies bid for 127 out of 1,794 whole or partial exploration blocks offered for Sale by MMS in April 2007. The blocks and partial blocks up for sale accounted for 9.4 million acres. Lease sale 195 was the most successful Beaufort Sea lease sale since 1988 when companies bid on 121 out of 338 partial or full blocks. In Lease Sale 186 held in 2003, oil companies bid on 34 out of 1,806 partial or full blocks. In Lease Sale 202 held in 2007, the most intense bidding was around the 1980s Hammerhead offshore discovery. Hammerhead is located approximately 20 miles offshore north of the onshore Point Thomson gas and condensate field.

The near shore area of the Beaufort has an extensive history of exploration with several oil and gas discoveries. The Northstar field that includes mostly state, but some OCS resources started production in 2001. Oooguruk, a more recent discovery in state waters, started production in June 2008 and Liberty, which is an offshore discovery in federal OCS waters, is proceeding to production.

According to the Environmental Assessment for Shell Offshore, Inc., Beaufort Sea Exploration Plan, open-water exploration drilling and testing might occur in any of 12 leases on six specific prospects (See Figure 4 for Shell's lease blocks). Three of the prospects are located in Camden Bay: Sivulliq, Lonestar, and Olympia. Sivulliq (formerly Hammerhead) is Shell's first priority and is located in the western part of the bay in 90 to 110 feet of water and about 45 miles east of Cross Island. The fourth and fifth prospects are located about 25 and 40 miles east of Baxter Island and are about 10 miles offshore. Cornell—the sixth prospect—is located about 20 miles north of the Colville River Delta.

Figure 4. Location of Shell Leases in the Beaufort Sea


Beaufort Sea
National Petroleum Reserve-Alaska
Arctic National Wildlife Refuge (1002 Area)
Arctic National Wildlife Refuge Wilderness Area
2008 Proposed Survey Boundary Area
Shell OCS Lease Block
Other Operator OCS Lease Block
Village
Road
Pipeline
State-Federal Water Boundary
Arctic National Wildlife Refuge
National Petroleum Reserve-Alaska
SHELL OFFSHORE INC.
2008 OPEN WATER 3-D SEISMIC & MARINE SURVEYS
BEAUFORT SEA
ASRC Energy Services
SCALE
Miles

Source: MMS http://www.mms.gov/alaska/cproject/beaufortsale/Sale202/bf_leases.pdf

3.1.2 Resource Estimates

Table 3 shows the results of the MMS 2006 resource assessment for the Beaufort Sea OCS. The table shows that the Beaufort Sea planning area has estimated technically recoverable oil and gas resources ranging from 527 million to 36 billion barrels of oil-equivalent energy (BOE). These estimates represent the potential quantities of undiscovered hydrocarbons that can be conventionally produced using existing or reasonably foreseeable technology, without any consideration of economic feasibility.

Table 3. 2006 Beaufort Sea Resource Assessment: Undiscovered Technically Recoverable Oil and Gas Resources (UTRR)

Resource Commodity	F95	Mean	F05
BOE (MMBOE)	527.0	13,142.0	36,078.0
Total Gas (TCFG)	0.6	27.6	72.2
Total Liquids (MMBO)	412.0	8,224.0	23,235.0
Free Gas (TCFG)	0.3	23.8	61.0
Solution Gas (TCFG)	0.3	3.9	11.2
Oil (MMBO)	405.0	7,224.0	20,625.0
Condensate (MMBC)	7.0	999.0	2,611.0

Source: Minerals Management Service, *2006 Oil and Gas Assessment: Beaufort Sea Planning Area (Alaska)-Province Summary.*

Notes: F95= 95% chance that resources will equal or exceed the given quantity. F05= 5% chance that resources will equal or exceed the given quantity. MMBOE= total oil and gas in millions of barrels-of-oil equivalent, where 1 barrel of oil = 5,620 cubic feet of natural gas. MMBO= millions of barrels of oil. TCFG = trillions of cubic feet of gas. MMBC= millions of barrels of condensate.

Table 4 shows the mean undiscovered economically recoverable resource (UERR) estimates by play for the Beaufort Sea OCS. The UERR estimates represent the portion of the undiscovered technically recoverable resources (UTRR) that can be explored, developed, and commercially produced at given costs and price considerations. The UERR estimates shown below assume resource commodity prices of $60 per barrel of oil and $9.07 per thousand cubic feet of gas. At these prices, the mean estimates of commercially producible resources in the Beaufort could be 5.4 billion barrels of oil (or 5.9 billion barrels including condensate) and 12.84 trillion cubic feet of natural gas (or 15.9 TCF including solution gas).

The resource estimates for each play were used to develop the production scenario for the study. The production scenarios are further explained in Section 3.1.6.

Table 4. Beaufort Sea: Mean Risked, Undiscovered, Economically Recoverable Oil and Gas Resources by Play (UERR)

Play Name	Oil (MMBO)	Gas Condensate (MMBC)	Free Gas (TCFG)	Solution Gas (TCFG)
Undeformed Pre-Mississippian Basement	0	0	0	0
Endicott	220	5	0.21	0.24
Lisburne	116	1	0.06	0.13
Upper Ellesmerian	1,102	15	0.81	1.20
Rift	614	19	0.71	0.69
Brookian Faulted Western Topset	108	49	1.06	0.02
Brookian Unstructured Western Topset	310	14	0.3	0.07
Brookian Faulted Western Turbidite	3	6	0.11	0
Brookian Unstructured Western Turbidite	74	5	0.1	0.05
Brookian Faulted Eastern Topset	481	288	6.22	0.11
Brookian Unstructured Eastern Topset	502	8	0.18	0.11
Brookian Faulted Eastern Turbidite	16	36	0.71	0.01
Brookian Unstructured Eastern Turbidite	60	4	0.08	0.04
Brookian Foldbelt	1,811	102	2.29	0.40
Sum of All Plays	**5,417**	**551**	**12.84**	**3.09**

Source: Minerals Management Service, *2006 Oil and Gas Assessment: Beaufort Sea Planning Area (Alaska)-Province Summary.*

Notes: The assessment was based on $60 per barrel of oil and $9.07 per mcf of natural gas. MMBO= million barrels of oil. TCFG = trillion cubic feet of gas. Note on the *Sum of all Plays*—play resource values are rounded and may not sum to totals reported from basin aggregation.

3.1.3 Exploration

The following describes the seismic surveys and exploratory drilling activities assumed in the Beaufort OCS.

Seismic Surveys

Numerous seismic surveys have been conducted in the federal waters of the Beaufort Sea dating back to the 1960s with peak activity in the 1980s. In 1983, MMS issued 23 permits (11 marine and 123 over-ice 2D (two-dimensional] permits). In 1984, they issued 24 permits including one 3D (three-dimensional) over-ice survey, fourteen 2D over ice surveys, and nine 2D marine surveys. Before the 2006 open water season, more than 100,000 line-miles of 2D and 3D seismic surveys were collected in the Beaufort Sea Planning area. Four seismic permits were issued in the 2006. According to the scenario, an additional 19 surveys are indicated with 26 exploration and 21 delineation wells. Table 5 shows the annual seismic and exploration activities in the Beaufort Sea scenario.

Table 5. Schedule for Seismic and Exploration Activities in the Beaufort Sea

Year	Seismic Activity	Exploration/Delineation Wells	Exploration Drilling Rigs
2008	1		
2009	2	4	2
2010	1	2	1
2011	2	3	2
2012	1	2	2
2013	1	4	3
2014	2	3	2
2015	1	4	3
2016	2	1	1
2017	1	3	3
2018	1	5	3
2019	1	6	3
2020	1	3	1
2021	1	1	1
2022	1	3	2
2023		3	2
Total	**19**	**47**	**31**

Source: Northern Economics, Inc. estimates based in part on MMS scenarios in *Beaufort Sea Planning Area Oil and Gas Lease Sales 186, 195, and 202 Final Environmental Impact Statement*. OCS EIS/EA MMS 2003-01. February 2003.

Exploratory Drilling

According to MMS, because of the water depth and remoteness of the area, exploratory drilling operations are likely to use drill ships with ice-breaker support vessels. Bottom-founded drilling platforms are precluded because of water depth and possible pack-ice incursions during the open water season. The use of drill ships allows the operator to temporarily move off the drill site as required. The analysis assumes that because of the short season of open water (July to October) that only one or two wells could be drilled per season per vessel. Drilling at each site is estimated to take 60 to 90 days and is affected by target depth and any difficulties encountered during drilling, and logging/testing operations.

Shell's planned 2007 program envisioned the use of two drill rigs each open water season—each rig drilling up to two wells between early July and mid-November, weather and ice permitting. Shell's drilling activities would have included a drill ship and a floating rig with a 12-point anchoring system developed specially for drilling in the arctic with two icebreakers as support vessels each season.

3.1.4 Development

The Beaufort development scenario assumes construction of a number of offshore and onshore transportation and production facilities. The MMS scenario assumed that where possible, exploration-drilling operations and construction, development, and production activities would draw on support from existing or upgraded facilities within the Prudhoe Bay or Kuparuk units. This assumption anticipates that commercial discoveries would occur in close proximity to Prudhoe Bay or Kuparuk and commercial terms could be reached on cost-sharing. However, a number of the most promising prospects are located some distance from the two units so this analysis assumes that a marine terminal, a support base, and other facilities are constructed to support the offshore platforms.

The timing for the construction and installation of platforms and other facilities, including the timing for various production activities are shown in Table 6.

MMS used an assumption that activities would progressively expand away from the core infrastructure near Prudhoe Bay, and that smaller discoveries located near existing infrastructure could be developed but larger discoveries would be needed as distance from infrastructure increases. Thus the Beaufort Sea OCS development scenario has more fields and smaller fields than the other basins. It is assumed that there will be seven production platforms in the Beaufort with over 200 production wells.

The production scenario assumes approximately 165 miles of new offshore pipeline and 70 miles of new onshore pipelines are built over several years starting in 2016 and this infrastructure ties into the existing crude oil transportation system on the North Slope and to the proposed natural gas pipeline. New onshore facilities include a marine terminal, a support base (shore base), and a production facility. The table below also shows the timing for field abandonment; two fields continue production beyond the 2057 timeframe. Abandonment is an activity that generates direct manpower requirements and is part of the manpower model.

Table 6. Development and Production Activity Schedule for Beaufort Sea

Year	Install Production Platforms	Drill Production/ Injection Wells	Construct Onshore/Offshore Pipelines (Miles)	Construct Onshore Facilities	Abandon Platforms
2016			35	3	
2017	1	3	15		
2018		10	0		
2019	1	13	25		
2020	1	26	25		
2021		20	0		
2022	1	13	25		
2023		20	0		
2024	1	13	15		
2025		20	0		
2026	1	13	15		
2027	1	23	50		
2028		20	15		
2029		20	0		
2030		10	15		
2031					
...	...	...	...	...	...
2044					
2045					1
2046					1
2048					1
2049					
2050					1
2051					
2052					
2053					
2054					1
Total	**7**	**224**	**235**	**3**	**5**

Source: :Northern Economics, Inc. estimates based in part on MMS scenarios in *Beaufort Sea Planning Area Oil and Gas Lease Sales 186, 195, and 202 Final Environmental Impact Statement.* OCS EIS/EA MMS 2003-01. February 2003.

Note: From 2031 through 2044 there is no activity for the items shown in this table.

3.1.5 Transportation of Materials, Supplies, and Personnel

Table 7 shows the vessel and air transport activities that MMS developed in its scenario for the Beaufort Sea. The term *Permanently in Area* indicates that the vessels would be present during drilling operations. The 2007 exploration plan for Shell would have used a small fleet of vessels including the drillship Discover and the Kulluk, a vessel built specifically for drilling offshore in the Arctic. The fleet also would have included two large icebreakers, support vessels for ice management, anchor-handling, a new 300 foot oil spill response vessel and an oil spill response barge, and associated tug to carry spill containment and clean-up equipment (Bradner 2007). Shell's plans also included the operation of another vessel working on marine subsea hazards and geotechnical soils surveys.

Table 7. Vessel and Aircraft Traffic to Support Beaufort Exploration

Type	Maximum Number in Area at any Time	Trip Frequency or Duration
Offshore Support Vessels	12	Permanently in Area
Tug Boats	1	Permanently in Area
Anchor Handling/Supply Vessels	3	Permanently in Area
Ice Breaker	2	Permanently in Area
Oil Spill Response Vessel	1	Permanently in Area
Diesel Oil Supply Vessel	1	Once per Season
Fixed Wing Aircraft	3	Once per Day
Helicopter	3	Twice per Day

Source: Minerals Management Service. Environmental Assessment – Beaufort Sea OCS-Y-1743, 1805, 1807, 1808, 1809, 1817, 1828, 1834, 1841, 1842, 1845, and 1849. OCSEISIEA MMS 2007-009.

3.1.6 Production

The production scenario for the Beaufort Sea assumes six oil fields, as assumed in the MMS scenarios, and 1 gas field. The gas field was added in this study, and is assumed to result from Lease Sale 217 (scheduled in 2011) and come on line in 2029 several years after a gas pipeline is built.

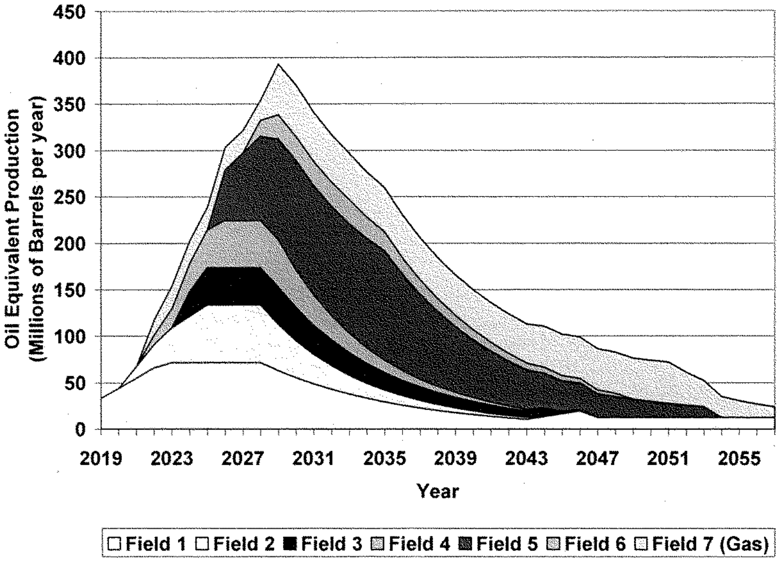
The scenario includes production of oil, condensates, free gas, and associated gas from OCS fields at volumes that are based on the 2006 MMS resource assessment of economically recoverable resources in the Beaufort Sea (assuming $60 per barrel of oil and $9 per MCF of natural gas). These resource estimates are shown in Table 4. The production scenario for this study assumes that the plays with the highest economically recoverable estimates of oil and gas would be developed; the assumption is that one field would be developed to produce the economically recoverable resources available in a selected play. The following plays were selected for the Beaufort scenario: Upper Ellesmerian (oil field), Rift (oil field), Brookian Faulted Eastern Topset (oil field and gas field), Brookian Unstructured Eastern Topset (oil field), Brookian Foldbelt (oil field), Brookian Unstructured Western Topset (oilfield). Total production volumes from the 7 fields for the various resources are shown in Table 8. Since two fields could continue producing after the timeframe of the analysis, total volumes produced do not exactly correspond to the estimated amount of economical recoverable resources for the plays identified above.

Table 8. Volume of Resources Assumed to be Produced in the Beaufort OCS Fields

Resource	Volume
Oil (MMbo)	4,821.08
Free Gas (Tcf)	6.03
Solution Gas (Tcf)	0.93
Condensate (MMbc)	0.29

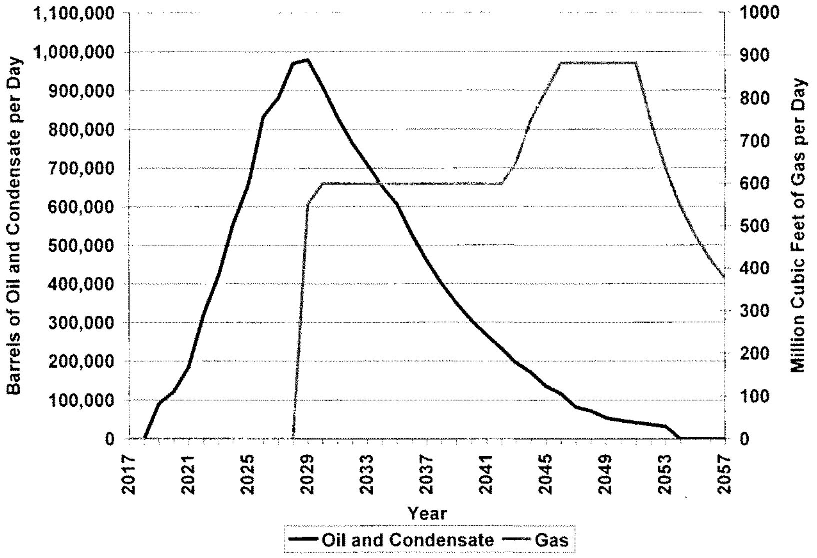
Figure 5 shows the timing of production and annual production volumes per field in the Beaufort Sea. First oil is assumed to come on line in 2019 and first gas is assumed to flow in 2029. The first gas could be associated with an expansion of the proposed natural gas pipeline from the North Slope to other North American markets. Figure 6 shows the total daily production volumes and Table 9 shows the total annual production volumes of oil and gas across all fields in the Beaufort OCS. The second increase in gas production starting in 2043 is related to production of associated gas from the oil fields. Prior to that time the natural gas is re-injected to maintain reservoir pressure for oil production until such time as the oil volumes are minimal.

Figure 5. Projected Annual Oil and Gas Production by Field in the Beaufort Sea OCS



Source: Northern Economics, Inc. estimates based in part on MMS scenarios in *Beaufort Sea Planning Area Oil and Gas Lease Sales 186, 195, and 202 Final Environmental Impact Statement.* OCS EIS/EA MMS 2003-01. February 2003.

Figure 6. Projected Daily Oil and Gas Production in the Beaufort Sea OCS



Source: Northern Economics, Inc. estimates based in part on MMS scenarios in *Beaufort Sea Planning Area Oil and Gas Lease Sales 186, 195, and 202 Final Environmental Impact Statement.* OCS EIS/EA MMS 2003-01. February 2003.

Table 9. Total Annual Production Volumes of Oil and Gas Assumed in the Beaufort Production Scenario

Year	Annual Oil and Condensate Production (in million barrels)	Annual Gas Production (in billion cubic feet)
2019	33.1	
2020	44.1	
2021	67.6	
2022	117.0	
2023	153.4	
2024	202.4	
2025	238.9	
2026	303.4	
2027	321.5	
2028	353.8	
2029	357.3	201
2030	331.7	219
2031	302.7	219
2032	278.5	219
2033	258.3	219
2034	238.1	219
2035	221.1	219
2036	192.4	219
2037	167.7	219
2038	146.2	219
2039	127.6	219
2040	111.4	219
2041	97.3	219
2042	85.1	219
2043	71.3	237
2044	62.4	274
2045	49.4	298
2046	42.1	322
2047	29.8	322
2048	26.2	322
2049	19.7	322
2050	17.3	322
2051	15.2	322
2052	13.4	272
2053	11.8	232
2054		200
2055		174
2056		154
2057		137
Total	**5,109**	**6,961**

Source: Northern Economics, Inc. estimates based in part on MMS scenarios in *Beaufort Sea Planning Area Oil and Gas Lease Sales 186, 195, and 202 Final Environmental Impact Statement*. OCS EIS/EA MMS 2003-01. February 2003.

3.2 Chukchi Sea Scenario

Five likely prospects were previously drilled on the Chukchi shelf: Burger, Klondike, Crackerjack, Popcorn, and Diamond. All five encountered favorable geology but commercial quantities of oil or gas (at the price expectation then in existence for oil and gas) were not discovered. When exploration of the Chukchi Sea was discontinued in 1992, there were 483 active leases in the Chukchi Sea; none remain active today. Given the recent surge in the price of oil and gas and renewed access to leasing however, there has been renewed interest in developing offshore resources in the Chukchi Sea. In fact, the MMS Chukchi Lease Sale 193 held in February 2008, collected $2.66 billion in high bids for 488 tracts; making it the biggest lease sale (onshore or offshore) in Alaska's history.

MMS developed several scenarios for the environmental impacts analysis of Lease Sale 193. The scenario presented here for the Chukchi Sea is based in part on MMS's exploration and development scenarios. MMS's development and production scenario Lease Sale 193 includes the development of one large field producing one billion barrels (Bbbl). Lower oil volumes are not likely to be economically recoverable and locating larger volumes in a single pool is rare. The previous lease sale in the Chukchi Sea, Lease Sale 126, presented three separate resource levels: low, base case, and high. In contrast, Lease Sale 193 presented a single case analysis representing the statistically most likely development activity given the uncertainties of geology, engineering, and economics.

To date, no petroleum development has occurred in the Chukchi, and while high oil and gas prices attract investment activity, development in the Chukchi Sea faces a number of logistical and regulatory hurdles. MMS makes the assumption that in such a frontier area only the largest prospect would be developed initially. The project must be large enough to cover the high costs of the initial infrastructure and the logistical and regulatory hurdles. Two logistical hurdles to overcome are the location of base support facilities and resolution of transport issues. Once the infrastructure is developed for the major field, smaller fields could be brought into production to supplement the oil production.

The MMS Lease Sale 193 analysis is based on the assumption that gas would not be developed within the proposed timeframe of their analysis. More recent presentations by MMS staff indicate that gas could be developed in the Chukchi. The difference in these outlooks is based in part on differences in underlying assumptions about reasonably foreseeable events, and information from companies that are exploring the planning area. In addition, the price of oil at the time the EIS analysis was written was approximately $50 a barrel. Our analysis is based on the assumption that the long-term price of oil is more likely to be in the $60 to $70 per barrel range.

The MMS scenario for Sale 193 considered offshore gas production as speculative rather than foreseeable because of the lack of existing transportation infrastructure to move produced gas to market. The more recent presentations assume that construction of an Alaska gas pipeline is a reasonably foreseeable event and a pipeline from the Chukchi Sea coast to Prudhoe Bay could be built, or that ice strengthened liquefied natural gas (LNG) tankers could be built to move gas to world markets.

The Energy Information Administration (EIA) anticipates that natural gas prices in the lower 48 states could be in the $6 per thousand cubic feet (2006 $) range from 2020 through 2030 due to increased gas production from the Gulf of Mexico. At these prices, MMS does not anticipate significant gas production from the Chukchi Planning Area, even though very large gas resources are interpreted to exist in the area. However, after 2030, EIA anticipates that gas prices might exceed $7 and at that price MMS's resource assessment anticipates substantial production from the Chukchi. Therefore, a large gas field is assumed to be brought into production after 2030 in the scenario developed for this report. The volume of free gas and associated gas produced through 2057 is 7.78 TCF.

The Chukchi Sea OCS scenario assumes that seismic, exploration, and production activities occur from 2008 and past 2057. Three fields are assumed to be discovered with total oil and condensate production of 4.79 billion barrels over that time period. The following sub-sections discuss the Chukchi scenario in more detail.

3.2.1 Size and Location of Program Area

The MMS five-year planning program for 2002-2007 identified a planning area of approximately 6,156 whole and partial blocks, which cover 34 million acres (Figure 7). At the time they excluded a corridor that varied in width from a little less than 25 miles from the coast up to about 50 miles from the coast. Water depths in the sale area vary from 95 feet to approximately 262 feet. However, a small portion of the northeast corner of the area deepens to approximately 9,800 feet. The Lease Sale 193 planning area includes a 1,952-block area north of Barrow that before 1991 was part of the Beaufort Sea Planning Area. MMS offered previous portions of the current planning area in four previous sales: Beaufort Sea Sale 97 and Chukchi Sea Sale 109 in 1988, and Beaufort Sea Sale 124 and Chukchi Sea Sale 126 in 1991. As a result, extensive seismic activity has taken place within the current boundaries of the Chukchi Planning Area.

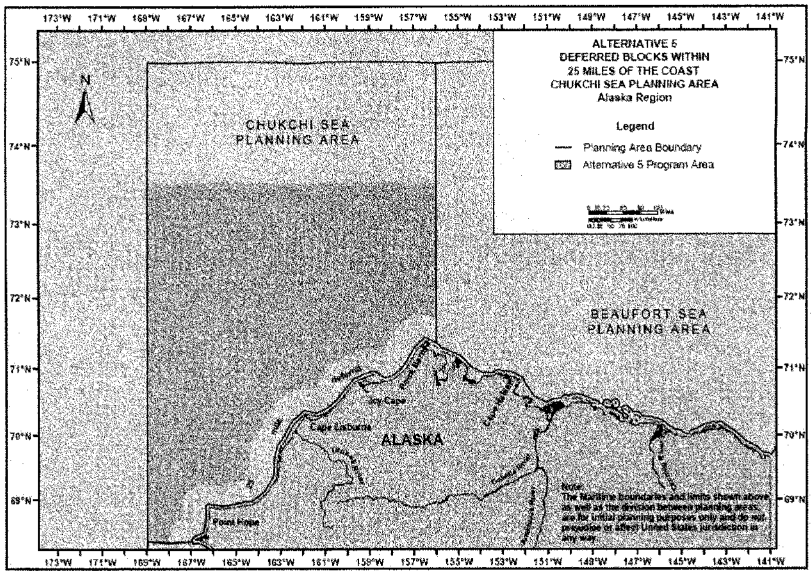
During the decision process for Lease Sale 193, the Secretary of the interior adopted a deferral area that deleted 6 additional blocks from the previously configured sale area so that no tracts closer than 25 miles from the coast would be offered. MMS designed the resource assessment model on the concept that the entire area is open for exploration.

In August 2007, MMS initiated the planning process and a multiple sale EIS for the two Beaufort Sea sales (Sales 209 and 217) and the last two Chukchi Se sales (Sales 212 and 221) in the 2007-2012 Five-Year Program. This multiple sale EIS will incorporate the planning and analysis for the sales. MMS will then prepare Environmental Assessments before making the final decisions on Sales 217 and 221.

According to the MMS news release, the Chukchi Sea 40-million acre planning area is located:

> ...offshore Alaska's northwest coast from north of Point Hope to northwest of Cape Lisburne. The sale extends from about 35 to 275 statue miles offshore. The proposed sale area excludes waters within 25 miles of the coast. This buffer zone encompasses the "polynya: a system of ice leads through which the bowhead and beluga whales, other marine mammals, and marine birds migrate north in the spring, and in which local communities subsistence hunt."

Figure 7. Program Area, Chukchi Sea, Lease Sale 193


173°W
171°W
169°W
167°W
165°W
163°W
161°W
159°W
157°W
155°W
153°W
151°W
149°W
147°W
145°W
143°W
141°W
75°N
74°N
73°N
72°N
71°N
70°N
69°N
N
ALTERNATIVE 5
DEFERRED BLOCKS WITHIN
25 MILES OF THE COAST
CHUKCHI SEA PLANNING AREA
Alaska Region
Legend
Planning Area Boundary
Alternative 5 Program Area
CHUKCHI SEA PLANNING AREA
BEAUFORT SEA PLANNING AREA
ALASKA
Icy Cape
Cape Lisburne
Point Hope
Note:
The Maritime boundaries and limits shown above as well as the division between planning areas, are for initial planning purposes only and do not prejudice or affect United States jurisdiction in any way.

Source: Mineral Management Service, Draft Environmental Impact Statement accessed at http://www.mms.gov/alaska/ref/EIS%20EA/Chukchi_DEIS_193/Maps.pdf on December 11, 2007.
Note: Map does not show deferral alternative.

3.2.2 Resource Estimates

The Chukchi Sea area is considered to have a high potential for natural gas occurrence because the geology is similar to confirmed plays on the North Slope and many of the large prospects are mapped, and some have been drilled. In preparation for the 2007-2012 Five-Year Program, MMS revised its assessments of the undiscovered oil and gas resource potential of the Alaska Outer Continental Shelf including the Chukchi Sea. Table 10 shows that the Chukchi Sea planning area has estimated technically recoverable oil and gas resources ranging from 4 billion to 77 billion barrels of oil-equivalent energy (BOE). These estimates represent the potential quantities of undiscovered hydrocarbons that can be conventionally produced using existing or reasonably foreseeable technology, without any consideration of economic feasibility.

Table 11 shows the mean undiscovered economically recoverable resource (UERR) estimates by play for the Chukchi Sea OCS. The UERR estimates represent the portion of the undiscovered technically recoverable resources (UTRR) that can be explored, developed, and commercially produced at given costs and price considerations. The UERR estimates shown below assume resource commodity prices of $60 per barrel of oil and $9.07 per thousand cubic feet of gas. At these prices, the mean estimates of commercially producible resources in the Chukchi Sea planning area could be 8.38 billion barrels of oil and condensate, and 34.4 trillion cubic feet of natural gas (including solution gas).

Table 10. 2006 Chukchi Sea Resource Assessment: Undiscovered Technically Recoverable Oil and Gas Resources (UTRR)

Resource Commodity	F95	Mean	F05
BOE (MMBOE)	4,152.0	29,041.0	77,357.0
Total Gas (TCFG)	10.3	76.8	209.5
Total Liquids (MMBO)	2,317.0	15,380.0	40,075.0
Free Gas (TCFG)	8.1	57.1	156,879.0
Solution Gas (TCFG)	2.2	19.6	52.6
Oil (MMBO)	1,895.0	12,381.0	31,841.0
Condensate (MMBC)	421.0	2,999.0	8,234.0

Source: Minerals Management Service, *2006 Oil and Gas Assessment: Chukchi Sea Planning Area (Alaska)-Province Summary.*

Notes: F95= 95% chance that resources will equal or exceed the given quantity. F05= 5% chance that resources will equal or exceed the given quantity. MMBOE= total oil and gas in millions of barrels-of-oil equivalent, where 1 barrel of oil = 5,620 cubic feet of natural gas. MMBO= millions of barrels of oil. TCFG = trillions of cubic feet of gas. MMBC= millions of barrels of condensate.

Table 11. Chukchi Sea: Mean Risked, Undiscovered, Economically Recoverable Oil and Gas Resources by Play (UERR)

Play Name	Oil (MMBO)	Gas Condensate (MMBC)	Free Gas (TCFG)	Solution Gas (TCFG)
Endicott-Chukchi Platform	1,310	162	2.79	3.17
Endicott-Artic Platform	4	7	0.11	0.01
Lisburne	27	2	0.04	0.08
Ellesmerian-Deep Gas	0	0	0	0
Sadlerochit-Chukchi Platform	126	37	0.60	0.37
Sadlerochit-Artic Platform	352	119	2.06	0.63
Rift-Active Margin	2,124	313	5.60	2.04
Rift-Stable Shelf	1,160	232	4.20	2.39
Rift-Deep Gas	0	0	0	0
L. Brookian Floodbelt	687	216	3.78	0.55
L. Brookian Wrench Zone-Torok Turbidites	34	13	0.21	0.07
L. Brookian Wrench Zone-Nanushuk Topset	44	10	0.16	0.11
Brookian North Chukchi High-Sand Apron	279	74	1.25	0.74
L. Brookian N Chucki Basin-Topset	2	1	0.02	0.01
Brookian- Deep Gas	0	0	0	0
L. Brookian-Torok-Arctic Platform	1	0	0	0
L. Brookian-Nanushuk Arctic Platform	122	5	0.09	0.08
U. Brookian-Sag Phase-North Chukchi Basin	0	0	0	0
U. Brookian-Tertiary Turbidites-North Chukchi Basin	0	0	0	0
U. Brookian-Tertiary Fluvial Valleys	538	77	1.37	0.51
U. Brookian-Intervalley Ridges	137	6	0.10	0.05
Franklinian-Northeast Chucki Basin	5	9	0.14	0.01
L. Brookian-Nuwuk Basin	12	9	0.15	0.02
U. Brookian-Nuwuk Basin	76	37	0.61	0.12
Hope-Late Sequence (HB Play 1)	6	3	0.13	0
Hope-Early Sequence (HB Play 2)	2	1	0.05	0
Hope-Shallow Basal Sands (HB Play 3)	0	0	0.01	0
Sum of All Plays	**7,048**	**1,333**	**23.47**	**10.96**

Source: Minerals Management Service, *2006 Oil and Gas Assessment: Chukchi Sea Planning Area (Alaska)-Province Summary.*

Notes: The assessment was based on $60 per barrel of oil and $9.07 per mcf of natural gas. MMBO= million barrels of oil. MMBC= million barrels of condensate. TCFG = trillion cubic feet of gas.

3.2.3 Exploration

According to MMS, because of the water depth and remoteness of the area, exploratory drilling operations are likely to use drill ships with ice-breaker support vessels. Bottom-founded exploration drilling platforms are less likely to be considered by industry because of water depth and possible pack-ice incursions during the open water season; however, other drilling options may be currently under study. The use of drill ships allows the operator to temporarily move off the drill site as required. The analysis assumes that because of the short season of open water (July to October) that only one or two wells could be drilled per season. Drilling at each site is estimated to take 60 to

90 days and is affected by target depth and any difficulties encountered during drilling and logging/testing operations. Five previous wells have been drilled on the Chukchi Sea. It is assumed that about 43 exploratory and delineation wells could be drilled to discover and delineate four of the commercial fields.

Table 12 shows the schedule of seismic and exploration activities assumed for the Chukchi Sea.

Table 12. Schedule for Seismic and Exploration Activities in the Chukchi Sea

Year	Seismic Surveys	Exploration/ Delineation Wells	Exploration Drilling Rigs per Season
2008	1	0	0
2009	4	0	0
2010	3	0	0
2011	3	2	1
2012	2	2	1
2013	1	2	1
2014	1	2	1
2015	1	2	1
2016	1	1	1
2017	1	1	1
2018	0	3	2
2019	1	1	1
2020	1	2	1
2021	0	1	1
2022	0	0	0
2023	1	0	0
2024	1	1	1
2025	1	1	1
2026	1	1	1
2027	1	2	1
2028	1	2	1
2029	0	0	0
2030	1	0	0
2031	1	0	0
2032	0	3	2
2033	1	3	2
2034	1	2	1
2035	0	3	2
2036	0	2	1
2037	0	2	1
2038	0	2	1
2039	0	1	1
Total`	**33**	**43**	**27**

Source: Northern Economics, Inc. estimates based in part on MMS scenarios in Minerals Management Service, *Chukchi Sea Planning Area: Oil and Gas Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea: Final Environmental Impact Statement. Volume I: Executive Summary, Sections I through VI.* OCS EIS/EA MMS 2007-226.

3.2.4 Development

The Chukchi development scenario assumes construction of offshore facilities and onshore facilities along the Chukchi coast. The timing and level of construction activities, drilling activities, and abandonment are placed along a timeline in Table 13. This scenario assumes new shore base and support facilities would be constructed to serve all four fields. An estimated 680 miles of onshore and offshore pipelines are built to transport the oil and gas resources, with the oil pipelines built first and the gas pipelines built when gas production commences. The Chukchi scenario used in this analysis includes two pipelines across the North Slope connecting to facilities at Prudhoe Bay. Around 250 miles of onshore oil pipeline would be built before oil production begins, followed by approximately 250 miles of gas pipeline prior to natural gas production. No platforms are abandoned during the study period in this scenario for the Chukchi Sea.

Table 13. Development and Production Activity Schedule for Chukchi Sea

Year	Install Production Platforms	Drill Production Wells	Construct Onshore & Offshore Pipelines (Miles)	Construct Onshore Facilities	Abandon Platforms
2019		0	150		
2020		0	135	3	
2021	2	8	50		
2022		24			
2023		28			
2024		8			
2025		4			
2026		4			
2027		4			
2028		4	15		
2029	1	4	15		
2030		12	15		
2031		14			
2032		14			
2033		6			
2034		6			
2035		4	100		
2036		5	100		
2037		5	50		
2038	1	11	10		
2039		18	10		
2040		14			
2041		4			
2042		4	10		
2043		4			
2044		4	10		
2045		4	10		
Total	**4**	**217**	**680**	**3**	**none**

Source: Northern Economics, Inc. estimates based in part on MMS scenarios in Minerals Management Service, *Chukchi Sea Planning Area: Oil and Gas Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea: Final Environmental Impact Statement. Volume I: Executive Summary, Sections I through VI.* OCS EIS/EA MMS 2007-026.

Note: Abandonment of platforms in the Chukchi Sea does not occur until after 2057 under this development scenario.

Development in the Chukchi Sea could require advances in new technology. Once a large field is delineated, a platform must be designed that can operate in the extreme environmental conditions in the Chukchi. While other bottom-founded platforms exist in high latitude settings worldwide, no platform has to date operated in environmental conditions similar to the Chukchi with its year-round ice movements and the likely relative water depth of any discovery (over 100 feet). According to MMS, the conceptual design proposed for the Chukchi is a circular platform with a wide base all constructed of concrete. The platform would be built in several sections, transported to the site, and then the components put together. The platform base would be pinned to the seafloor, which is expected to be relatively firm. A prepared berm might not be required. The wide base of the platform, anchoring system, and ballast in the cavities of the concrete would serve to stabilize the structure and help resist ice forces.

Topside space on the platform would be limited compared to the widespread area of the oil reservoir. According to MMS, possibly half or more of the total production wells may be subsea wells. These could be completed in templates with possibly four wells per template, and then production could be transported to the central platform some miles away through three-phase (i.e., oil, gas, and water) flow lines. If necessary, the subsea equipment and pipelines could be installed beneath the seafloor for protection against possible deep-keeled ice masses. The subsea wells would be drilled by drill ships during the summer open water season, while drilling on the platform could occur year-round.

This scenario assumes that subsea completions would be used in the Chukchi.

Gas and produced water can be separated from the production slurry on the central platform and the gas and water can be re-injected into the subsurface. The associated and solution gas that is produced can be used either as fuel for the facility or re-injected into the main reservoir to increase oil recovery until such time as a gas transportation system is in place.

Construction of the platform and installations of the flow line from the subsea templates along with the main oil pipeline from the platform can both occur during the short summer open-water seasons. MMS assumed that a 30- to 150-mile offshore pipeline would be required to transport oil from the platform to landfall. They anticipated a new facility constructed on the coast to support offshore operations and serve as the first pump station. An overland pipeline was also anticipated to connect to the TAPS. This 250-mile line would require the coordination of several land managers and could run through the NPR-A. Pump stations along the pipeline corridor might be co-located with oil fields along the route. One of the benefits of this transport alternative is that more marginal fields in proximity to the proposed pipeline could become economically viable.

MMS identified two other transport alternatives. One alternative involves construction of a LNG plant at the port terminal of the DeLong Mountain Transportation System, which ships concentrates from the Red Dog mine. New facilities would load oil and gas into oil or LNG tankers. Another alternative postulated by MMS would be construction and operation of an offshore platform capable of storing and loading crude oil and LNG in the Chukchi and transport of LNG and oil by tankers. Ice-capable tankers could be built and icebreakers could be used to assist in transit through areas of thick ice. However, the limited open water season in the Chukchi is a major constraint for both of these alternatives.

3.2.5 Transportation of Materials, Supplies, and Personnel

Seismic surveys are assumed to take place for about 30 days during the summer open-water season. The vessels used for these surveys are largely self-contained, so a minimum amount of helicopter support (one per day) would be required to transport needed personnel, seismic data and light supplies. MMS assumes that a smaller support vessel would make occasional trips—perhaps once every two weeks—to Barrow to refuel and resupply.

Exploratory drilling operations would need to be supported by both helicopters and supply vessels. MMS anticipated that helicopters would probably fly from Barrow to the site one to three times per day, but Kotzebue could also be used if the drilling location was closer. Support vessels would also make one to three trips a week to Barrow during the exploratory phase. Once a new shore base is completed, it is anticipated that the helicopter support could originate out of Barrow or the shore base.

Large quantities of materials, supplies, and personnel necessary to the operations must be transported to very remote sites. The supply base could be located anywhere along the Chukchi Sea coast, or even south of the Chukchi Sea. Dutch Harbor was used to support Shell's 2007 planned exploration activities. Shell has previously suggested that Kivalina or Kotzebue may also serve as a support base. The location of the onshore service base would be influenced by the location of the first major commercial discovery in the Chukchi Sea and the actual location is uncertain at this time.

Construction of the shore base is unlikely to occur until several years after a commercial discovery and could take several construction seasons to build. Construction requires a significant multimodal transportation effort. All of the heavy equipment and materials needed to build the shore base would be moved to the remote coastal site using barges, aircraft, and perhaps winter ice roads. There could be barge trips in the summer season originating in either West Dock or Nome, or ports further south. In addition, a number of helicopters might be required during peak periods. However, once construction is complete, the overall level of transportation in and out of the shore base would drop to operations phase levels.

3.2.6 Production

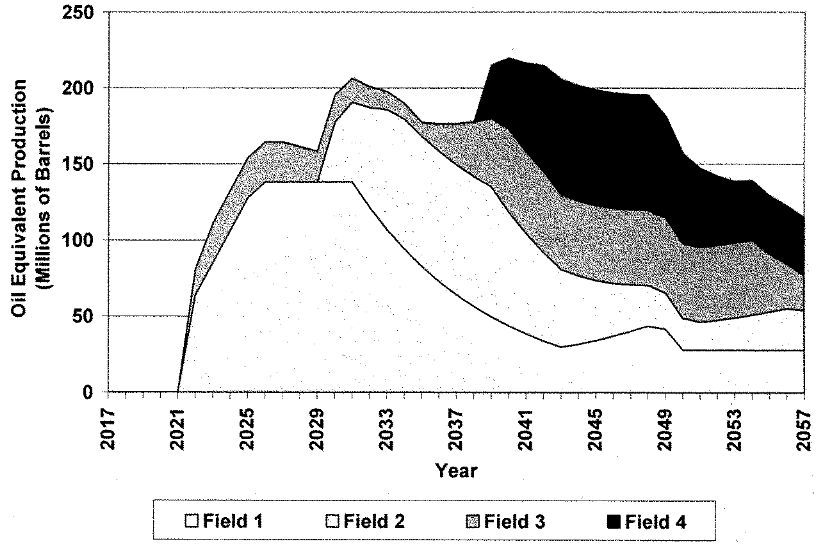
The Chukchi scenario assumes production from 3 oil fields and one gas field. The scenario assumes that these fields could produce the estimated volume of economically recoverable resources identified in the following plays: Endicott-Chukchi Platform (oil field); Rift Active Margin (oil field and gas field), Rift Stable Shelf (oil field). Total production of resources from the four fields is shown in Table 14.

Table 14. Volume of Resources Assumed to be Produced in the Chukchi OCS Fields

Total Production	Volume
Oil (MMbo)	4,473.34
Free Gas (Tcf)	5.28
Solution Gas (Tcf)	2.50
Condensate (MMbc)	313.15

Figure 8 shows the anticipated timing and production of oil and gas by field in the Chukchi Sea. According to this scenario, the first oil field comes online in 2022. Peak production could occur in 2024 through 2027 at 82 million barrels per year. The second smaller oil field could start producing in 2030 with peak production from 2033 through 2035 at 42 million barrels. Gas production could start in 2036 with peak production occurring in 2038 through 2047. Condensate production is assumed to start in 2022. Finally, the fourth field could peak at about 25 million barrels per year in 2040 through 2044.

Figure 8. Projected Annual Oil and Gas Production by Field in the Chukchi Sea OCS

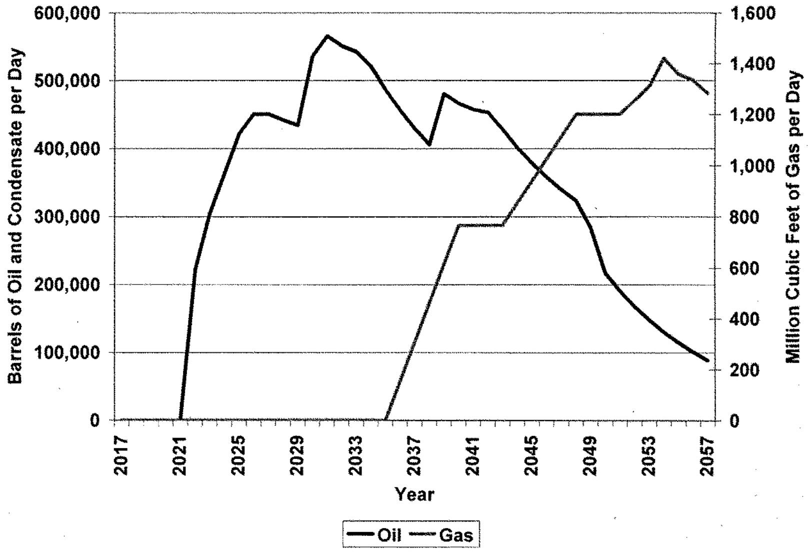


Source: Northern Economics, Inc. estimates based in part on MMS scenarios in Minerals Management Service, Chukchi Sea Planning Area: Oil and Gas Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea: Final Environmental Impact Statement. Volume I: Executive Summary, Sections I through VI. OCS EIS/EA MMS 2007-026.

Notes: The Chukchi scenario assumes oil and associated gas production from Fields 1, 2, and 4; and natural gas and condensates production from Field 3.

Figure 9 shows the total daily production volumes and Table 15 shows the total annual production volumes of oil and gas across all fields in the Chukchi Sea OCS.

Figure 9. Projected Daily Oil and Gas Production in the Chukchi Sea OCS



Source: Northern Economics, Inc. estimates based in part on MMS scenarios in Minerals Management Service, Chukchi Sea Planning Area: Oil and Gas Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea: Final Environmental Impact Statement. Volume I: Executive Summary, Sections I through VI. OCS EIS/EA MMS 2007-026.

Table 15. Total Annual Production Volumes of Oil and Gas Assumed in the Chukchi Sea Production Scenario

Year	Annual Oil and Condensate Production (in million barrels)	Annual Gas Production (in billion cubic feet)
2022	81.0	
2023	111.3	
2024	132.6	
2025	153.9	
2026	164.5	
2027	164.5	
2028	161.3	
2029	158.6	
2030	195.4	
2031	206.4	
2032	201.0	
2033	197.9	
2034	190.1	
2035	177.5	
2036	166.5	56.0
2037	156.7	112.0
2038	148.1	168.0
2039	175.4	224.0
2040	170.2	280.1
2041	166.9	280.1
2042	165.5	280.1
2043	156.4	280.1
2044	146.7	311.8
2045	138.1	343.5
2046	130.6	375.2
2047	124.0	406.9
2048	118.2	438.6
2049	104.0	438.6
2050	79.3	438.6
2051	69.8	438.6
2052	61.4	458.6
2053	54.1	478.6
2054	47.6	518.6
2055	41.9	495.6
2056	36.8	486.8
2057	32.4	468.9
Total	**4,786.5**	**7,779.1**

Source: Northern Economics, Inc. estimates based on MMS 2006 Resource Assessment.

3.3 North Aleutian Basin Scenario

In 1985, MMS conducted Lease Sale 92 in the North Aleutian Basin. Over 5.6 million acres were offered for bid. Water depth ranged from 30 to 100 meters. The proposed sale accounted for approximately 17 percent of the North Aleutian Basin Planning Area. The entire North Aleutian Basin incorporates all of Bristol Bay and adjacent waters out to Unimak Pass. In October 1988, 23 lease blocks covering 121,757 acres were leased.

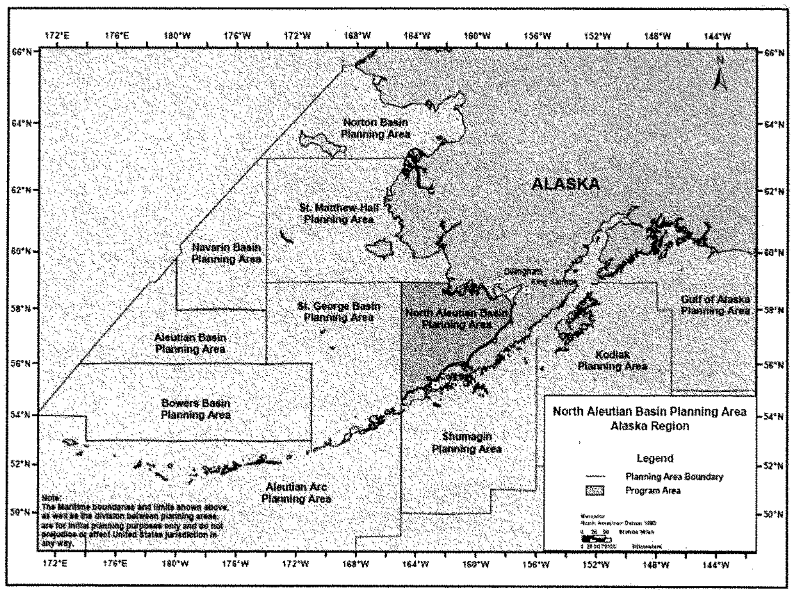
In 2003, President George W. Bush signed the Interior Appropriations Act for 2004 in which Congress lifted its moratorium on offshore drilling in Bristol Bay. Therefore, Minerals Management Service was allowed to include the federal waters of Bristol Bay in their Proposed Five-Year Program for Outer Continental Shelf Leasing 2007-2012. In January 2007, Present George W. Bush lifted the ban on offshore drilling in Bristol Bay by rescinding the presidential withdrawal. The current sale is limited to the 990 blocks off the Alaskan Peninsula that were evaluated for the earlier Alaska Lease Sale 92.

The following sub-sections discuss the North Aleutian scenario.

3.3.1 Size and Location of Program Area

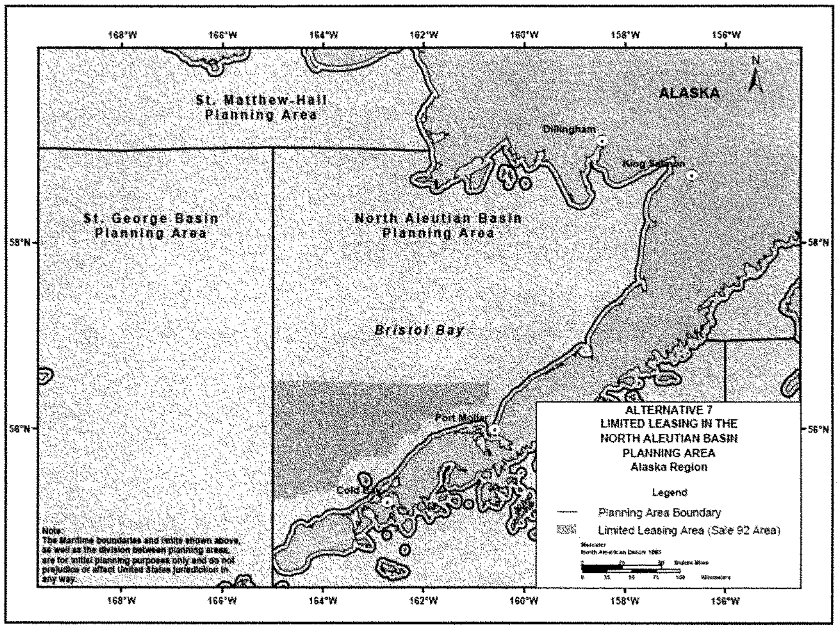
Figure 10 shows the North Aleutian Basin Planning Area, while Figure 11 shows the limited leasing area from Lease Sale 92. The program schedules a lease sale in the North Aleutian Basin for 2011.

Figure 10. North Aleutian Basin Planning Area


172°E
176°E
180°W
176°W
172°W
168°W
164°W
160°W
156°W
152°W
148°W
144°W
66°N
64°N
62°N
60°N
58°N
56°N
54°N
52°N
50°N
N
Norton Basin Planning Area
ALASKA
St. Matthew-Hall Planning Area
Navarin Basin Planning Area
Dillingham
King Salmon
St. George Basin Planning Area
North Aleutian Basin Planning Area
Gulf of Alaska Planning Area
Aleutian Basin Planning Area
Kodiak Planning Area
Bowers Basin Planning Area
Shumagin Planning Area
Aleutian Arc Planning Area
Note:
The Maritime boundaries and limits shown above, as well as the division between planning areas, are for initial planning purposes only and do not prejudice or affect United States jurisdiction in any way.
North Aleutian Basin Planning Area
Alaska Region
Legend
Planning Area Boundary
Program Area

Source: MMS http://www.mms.gov/5-year/2007-2012DEIS/VolumeII/Figures/II-1_II-10.pdf, 2007-2012 Five-Year Program.

Figure 11. Alternative 7 Limited Leasing Area in the North Aleutian Basin Planning Area


168°W
166°W
164°W
162°W
160°W
158°W
156°W
58°N
56°N
N
ALASKA
St. Matthew-Hall Planning Area
St. George Basin Planning Area
North Aleutian Basin Planning Area
Bristol Bay
Dillingham
King Salmon
Port Moller
Cold Bay
ALTERNATIVE 7
LIMITED LEASING IN THE
NORTH ALEUTIAN BASIN
PLANNING AREA
Alaska Region
Legend
Planning Area Boundary
Limited Leasing Area (Sale 92 Area)
Note:
The Maritime boundaries and limits shown above, as well as the division between planning areas, are for initial planning purposes only and do not prejudice or affect United States jurisdiction in any way.

Source: MMS http://www.mms.gov/5-year/2007-2012DEIS/VolumeII/Figures/II-1_II-10.pdf, 2007-2012 Five-Year Program.

3.3.2 Resource Estimates

The 1985 EIS for lease sale 92 was based in part on the assumption that the conditional mean resource estimates of 364 MMbbls of oil and 2.662 TCF of gas could be discovered and produced. In the original EIS under alternative 1, oil and gas production was scheduled to begin in 1993 and 1994, respectively, and reach a peak annual production in 1994 to 1999 for oil (31 MMbbls) and in 1995 to 2012 for gas (.126 TCF). MMS has identified this area as gas-prone but light crude oil is also possible as a secondary commodity.

Table 16 shows the oil and gas resource estimates for the North Aleutian Basin that were developed by MMS in their 2006 assessment; these estimates were used in developing the scenario for this study. The mean estimate for technically recoverable resources in this planning area ranges from 91 million to 6.6 billion barrels of oil-equivalent energy.

Table 17 shows the mean undiscovered economically recoverable resource (UERR) estimates by play for the North Aleutian Basin OCS. The UERR estimates represent the portion of the undiscovered technically recoverable resources (UTRR) that can be explored, developed, and commercially produced at given costs and price considerations. The UERR estimates shown below assume resource commodity prices of $60 per barrel of oil and $9.07 per thousand cubic feet of gas. At these prices, the mean estimates of commercially producible resources in the North Aleutian Basin planning area could be 0.7 billion barrels of oil and condensate, and 7.65 trillion cubic feet of natural gas (including solution or associated gas).

Table 16. 2006 North Aleutian Basin Resource Assessment: Undiscovered, Technically Recoverable Oil and Gas Resources (UTRR)

Resource Commodity	F95	Mean	F05
BOE (MMBOE)	91.0	2,287.0	6,647.0
Total Gas (TCFG)	0.4	8.6	23.3
Total Liquids (MMBO)	19.0	753.0	2,505.0
Free Gas (TCFG)	0.4	8.4	22.5
Solution Gas (TCFG)	0.0	0.2	0.8
Oil (MMBO)	9.0	545.0	1,948.0
Condensate (MMBC)	10.0	208.0	556.0

Source: Minerals Management Service, *2006 Oil and Gas Assessment: North Aleutian Basin Planning Area (Alaska)-Province Summary.*

Notes: F95= 95% chance that resources will equal or exceed the given quantity. F05= 5% chance that resources will equal or exceed the given quantity. MMBOE= total oil and gas in millions of barrels-of-oil equivalent, where 1 barrel of oil = 5,620 cubic feet of natural gas. MMBO= millions of barrels of oil. TCFG = trillions of cubic feet of gas. MMBC = millions of barrels of condensate.

Table 17. North Aleutian Basin: Mean Risked, Undiscovered, Economically Recoverable Oil and Gas Resources by Play (UERR)

Play Name	Oil (MMBO)	Gas Condensate (MMBC)	Free Gas (TCFG)	Solution Gas (TCFG)
Bear Lake/Stepovak (Miocene/Oligocene)	268	126	5.08	0.11
Tolstoi FM. (Eocene/Paleocene)	59	50	2.00	0.02
Black Hills Uplift- Amak Basin	136	5	0.18	0.06
Mesozoic- Deformed Sedimentary Rocks	32	0	0	0.01
Mesozoic Basement- Buried 'Granite Hills'	25	4	0.17	0.01
Sum of All Plays	**520**	**185**	**7.43**	**0.21**

Source: Minerals Management Service, *2006 Oil and Gas Assessment: North Aleutian Basin Planning Area (Alaska)-Province Summary.*

Notes: The assessment was based on $60 per barrel of oil and $9.07 per mcf of natural gas. MMBO= million barrels of oil. MMBC= million barrels of condensate. TCFG = trillion cubic feet of gas.

3.3.3 Exploration

In terms of facilities, the MMS scenario under the proposed action included:

- Drilling of 10 exploration and delineation wells between 1986 to 1991
- Installation of one oil and one gas production platform along with the drilling of 32 development/production wells during the period 1990 to 1993.

The scenario used for this current analysis includes seismic activity occurring from 2008 through 2015 (see Table 18), and uses a similar schedule for exploration and delineation drilling activities, although the beginning year is assumed to be 2008 rather than 1986.

Table 18. Schedule for Seismic and Exploration Activities in the North Aleutian Basin

Year	Seismic Activity	Exploration/Delineation Wells	Exploration Drilling Rig Seasons
2008	0		
2009	2		
2010	1		
2011	2		
2012	1	1	1
2013	1	1	1
2014	2	3	2
2015	1	2	2
2016		3	2
Total	**11**	**10**	**8**

Source: Northern Economics, Inc. estimates based in part on MMS scenarios in Minerals Management Service, *Final Environmental Impact Statement, Volumes 1, 2, Appendix A Exploration and Development Maximum Case* and *Appendix B Minimum Case, Proposed North Aleutian Basin Lease Sale (Sale 92).* September 1985.

Note. Lease Sale 214 in 2010; Lease Sale 223 in 2012.

3.3.4 Development

The development schedule for the North Aleutian Basin is shown in Table 19. The sequencing and timing of these activities is the same as presented in the 1985 EIS for Lease Sale 92, but the volume of produced oil and gas has been increased to reflect the newer resource assessment and the year when these activities takes place is moved forward in time with the first production-related activities occurring in 2016. Two major shore-based facilities are required with this scenario. One supply base is required on the Bering Sea side of the Alaska Peninsula for the supply boats and helicopters, and a second facility on the Pacific Ocean side of the Peninsula. The Pacific facility would include an LNG plant and provide marine terminals for oil and LNG tankers.

Table 19. Development and Production Activity Schedule for North Aleutian Basin

Year	Production Platforms	Production/injection Wells	Offshore/Onshore Pipelines (Miles)	New Shore Based Facilities
2016				1
2017			50	
2018	1		100	.25
2019		9		.25
2020		9	50	.25
2021		9	100	.25
2022	1	12		
2023		11		
2024		11		
Total	**2**	**61**	**300**	**2**

Source: Northern Economics, Inc. assumptions based in part on MMS scenarios in Minerals Management Service, *Final Environmental Impact Statement, Volumes 1, 2, Appendix A Exploration and Development Maximum Case* and *Appendix B Minimum Case, Proposed North Aleutian Basin Lease Sale (Sale 92)*. September 1985.

Note: For new shore based facilities the .25 indicates that 25 percent of the marine terminal and LNG plant is built in each of these four years.

Alternative 1 in the 1985 EIS proposed two methods of transport—either pipelines to landfall in the Port Moller area or offshore storage and loading with transport to markets by 80,000 dead weight tonnage tankers. This scenario assumes that offshore pipelines are built to the Alaska Peninsula, with onshore pipelines built across the Alaska Peninsula to a location on the Pacific Ocean coast. Gas produced from one offshore platform would be transported to an LNG liquefaction facility and then transported directly to a U.S. or Pacific Rim LNG re-gasification terminal via LNG tankers. Oil would be transported by pipeline to a separate terminal on the Pacific Ocean coast and then to U.S. or Pacific Rim markets via crude oil carriers.

During a Shell Oil presentation at the North Aleutian Basin meeting in 2006, Shell envisioned construction of offshore drilling production platforms with product transported via pipeline to a natural gas liquefaction facility on the Alaska Peninsula near Sand Point with the LNG transported to the U.S. West Coast market in tankers.

The marine support base for previous offshore operations in the North Aleutian Basin was located at Captains Bay near Dutch Harbor/Unalaska while Cold Bay was the primary air-support site (Patrick Burden & Associates 1985). If permanent facilities are built on either side of the Alaska Peninsula air strips could be built near the site of those facilities. Potential sites for an onshore service base are limited on the north side of the Alaska Peninsula. Two sites that might be considered are Unalaska or Port Moller, and the decision regarding which site to use likely hinges on the location of a commercial oil or gas discovery.

3.3.5 Production

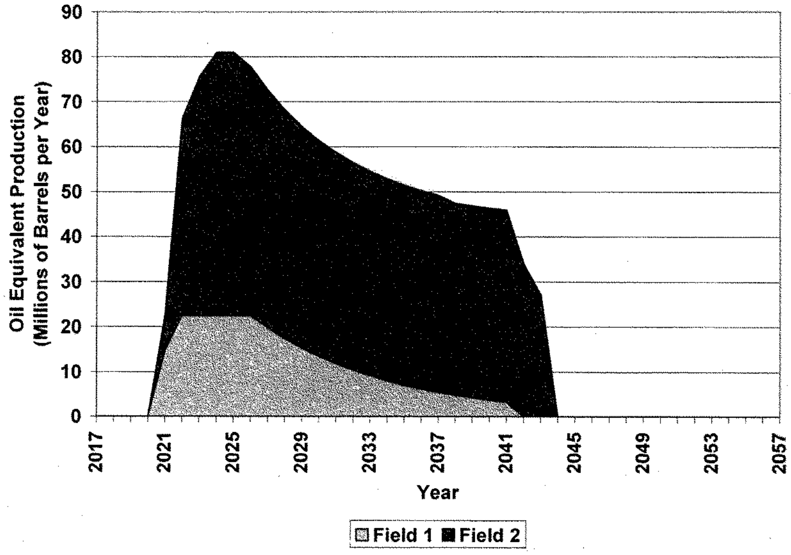
The North Aleutian scenario assumes production from one oil field and one gas field. The scenario assumes that these fields would produce the estimated volume of economically recoverable resources identified in the Bear Lake/Stepovak play. Total production of resources from the oil and gas fields is shown in Table 20.

Table 20. Volume of Resources Assumed to be Produced in the North Aleutian OCS Fields

Total Production	Volume
Oil (MMbo)	268.12
Free Gas (Tcf)	5.08
Solution Gas (Tcf)	None
Condensate (MMbc)	126.33

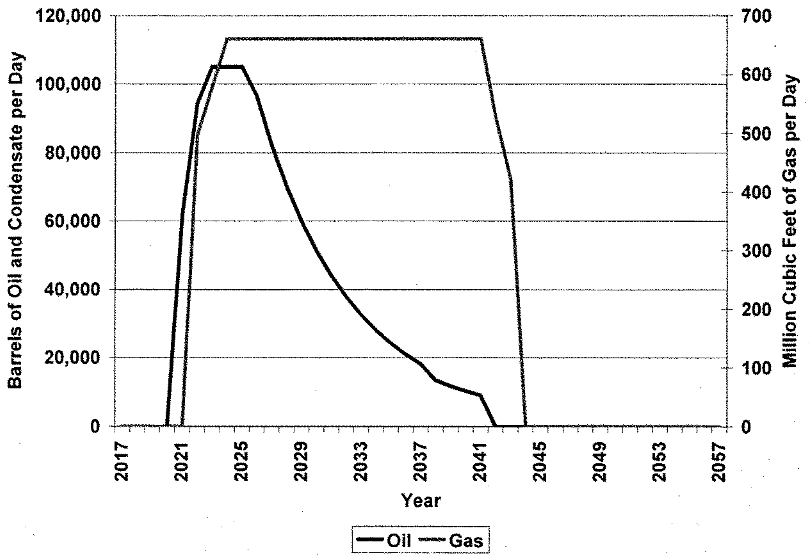
Figure 12 shows the timing of production and annual production volumes per field in the North Aleutian Basin. First oil is assumed to come on line in 2021 and first gas is assumed to flow in 2022. Figure 13 shows the total daily production volumes and Table 21 shows the total annual production volumes of oil and gas across all fields in the North Aleutian Basin OCS.

Figure 12. Projected Annual Oil and Gas Production by Field in the North Aleutian Basin OCS



Source: Northern Economics, Inc. estimates based in part on MMS scenarios in Minerals Management Service, *Final Environmental Impact Statement, Volumes 1, 2, Appendix A Exploration and Development Maximum Case* and *Appendix B Minimum Case, Proposed North Aleutian Basin Lease Sale (Sale 92).* September 1985.

Figure 13. Projected Daily Oil and Gas Production in the North Aleutian Basin OCS



Source: Northern Economics, Inc. estimates based in part on MMS scenarios in Minerals Management Service, *Final Environmental Impact Statement, Volumes 1, 2, Appendix A Exploration and Development Maximum Case* and *Appendix B Minimum Case, Proposed North Aleutian Basin Lease Sale (Sale 92)*. September 1985.

Table 21. Total Annual Production Volumes of Oil and Gas Assumed in the North Aleutian Basin Production Scenario

Year	Annual Oil and Condensate Production (in million barrels)	Annual Gas Production (in billion cubic feet)
2021	22.7	
2022	34.4	180.9
2023	38.4	211.1
2024	38.4	241.2
2025	38.4	241.2
2026	35.2	241.2
2027	29.9	241.2
2028	25.5	241.2
2029	21.8	241.2
2030	18.7	241.2
2031	16.0	241.2
2032	13.8	241.2
2033	11.9	241.2
2034	10.2	241.2
2035	8.8	241.2
2036	7.6	241.2
2037	6.6	241.2
2038	4.9	241.2
2039	4.3	241.2
2040	3.8	241.2
2041	3.3	241.2
2042		193.0
2043		154.4
Total	**394.5**	**5,080.9**

Source: Northern Economics, Inc. estimates based in part on MMS scenarios in Minerals Management Service, *Final Environmental Impact Statement, Volumes 1, 2, Appendix A Exploration and Development Maximum Case* and *Appendix B Minimum Case, Proposed North Aleutian Basin Lease Sale (Sale 92)*. September 1985.

4 Results and Findings

This section presents a potential outcome of future offshore oil and gas development in the Beaufort, Chukchi, and North Aleutian OCS areas. This potential future outcome is specifically based on the exploration, development, and production scenarios described in Section 3.

Oil and gas development in Alaska OCS areas is expected to generate direct and indirect jobs, and direct and indirect revenues to the state and local governments. The magnitude of these economic benefits would ultimately depend on the volumes of petroleum resources that might be discovered in the OCS areas, the levels of investment that oil and gas explorers, developers, and producers would be willing to spend in these areas, and the fiscal regime or tax structure that would be in effect as OCS oil and gas development occurs. There is still a great deal of uncertainty as to whether oil and gas production in the OCS would occur and if production does occur whether the levels of production assumed in this study would be reached. This study assumes that development would occur given the price and cost assumptions in the analysis and that there will be no regulatory impediments or delays to OCS development due to environmental restrictions.

The results presented in the following sections include potential OCS employment and population effects, potential revenue effects, and projected fiscal effects at the state and local levels. The results for each OCS area are discussed in separate sub-sections. Also included are summary results for the North Slope region (combined Beaufort and Chukchi results) and for all three Alaska OCS areas (total statewide results). This study is only focused on the potential economic effects of OCS development.

Before presenting the economic results, the potential incremental effect of OCS development on total oil and gas production in Alaska is discussed below.

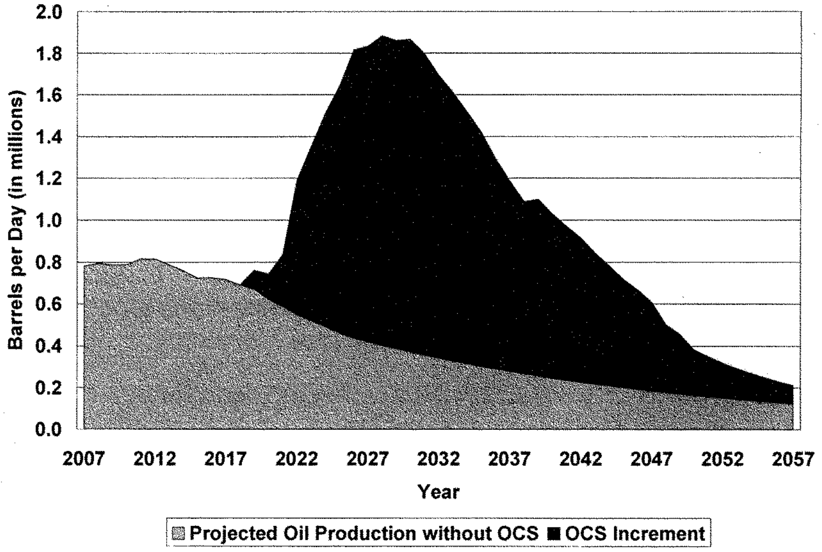
4.1 Incremental Oil and Gas Production

Without OCS development, cumulative statewide oil production through 2057 is projected to be 7.7 billion barrels and cumulative natural gas production is projected to be 62 TCF. OCS development in the Beaufort, Chukchi, and North Aleutian Basin could add an additional 10 billion barrels of oil and 19.8 TCF of natural gas to Alaska petroleum production through 2057. The combined incremental production from all three OCS areas over time is shown in Figure 14 and Figure 15.

The following charts illustrate the projected incremental oil and gas production over time from OCS development in the Beaufort Sea (Figure 16 and Figure 17), Chukchi Sea (Figure 18 and Figure 19), North Aleutian Basin (Figure 20 and Figure 21). Production scenarios for each of the basins are discussed in more detail in Section 3.

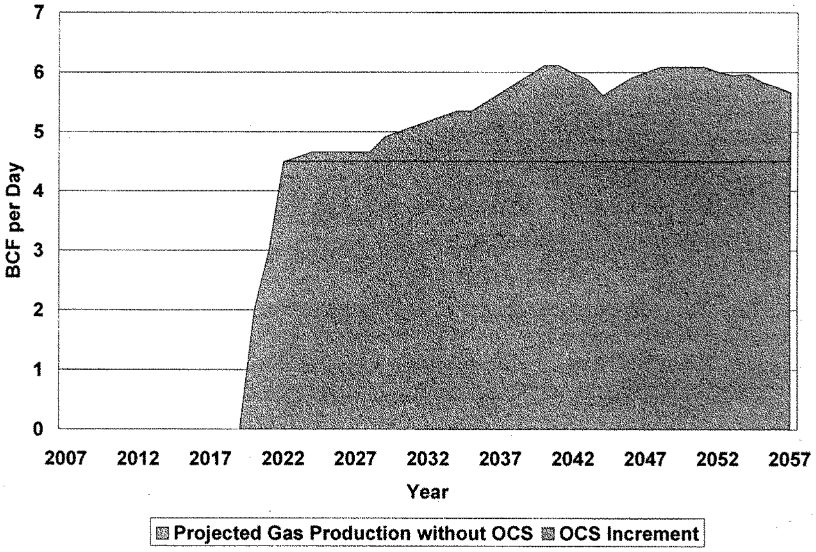
The charts presented below also show the projected statewide oil and gas production without OCS development. As noted in Section 2.2, a baseline economic projection without OCS development was developed to allow a comparison between a future with OCS development and a future without OCS development. This baseline analysis (without OCS development) assumes development and commercialization of natural gas from the North Slope starting in 2020 at daily volumes of 4.5 billion cubic feet and continuation of the declining trend in statewide oil production—reflecting the diminishing oil reserves in the major oil fields in the North Slope.

Figure 14. Incremental Oil Production from All Three Basins OCS Development



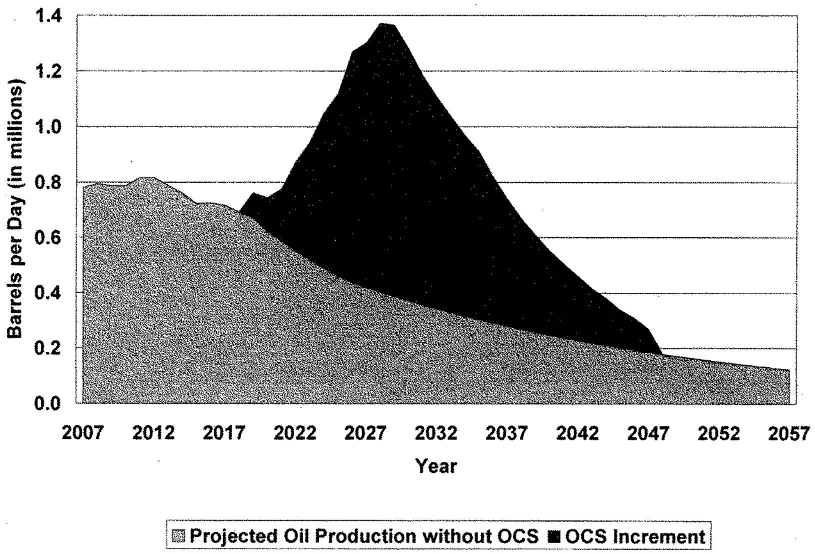
Source: Northern Economics, Inc. and ISER estimates based on scenarios developed for the study.

Figure 15. Incremental Gas Production from All Three Basins OCS Development



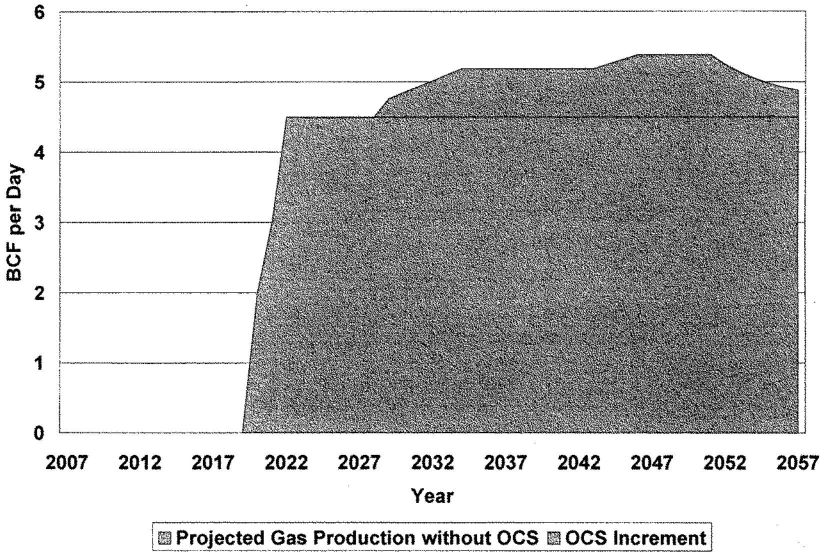
Source: Northern Economics, Inc. and ISER estimates based on scenarios developed for the study.

Figure 16. Incremental Oil Production from Beaufort OCS Development



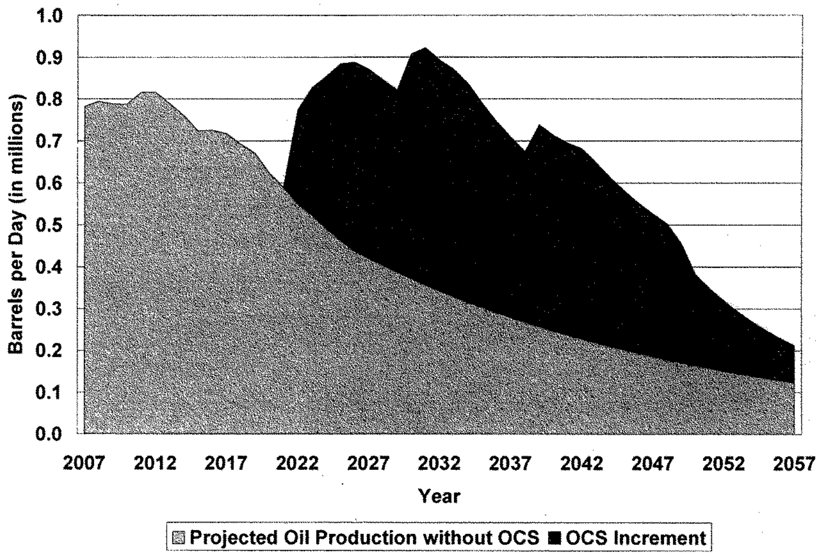
Source: Northern Economics, Inc. and ISER estimates based on scenarios developed for the study.

Figure 17. Incremental Gas Production from Beaufort OCS Development



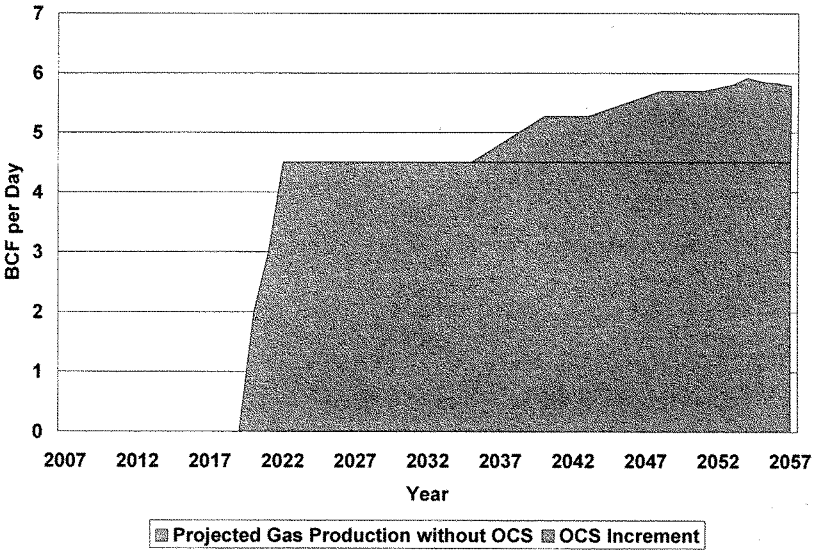
Source: Northern Economics, Inc. and ISER estimates based on scenarios developed for the study.

Figure 18. Incremental Oil Production from Chukchi OCS Development



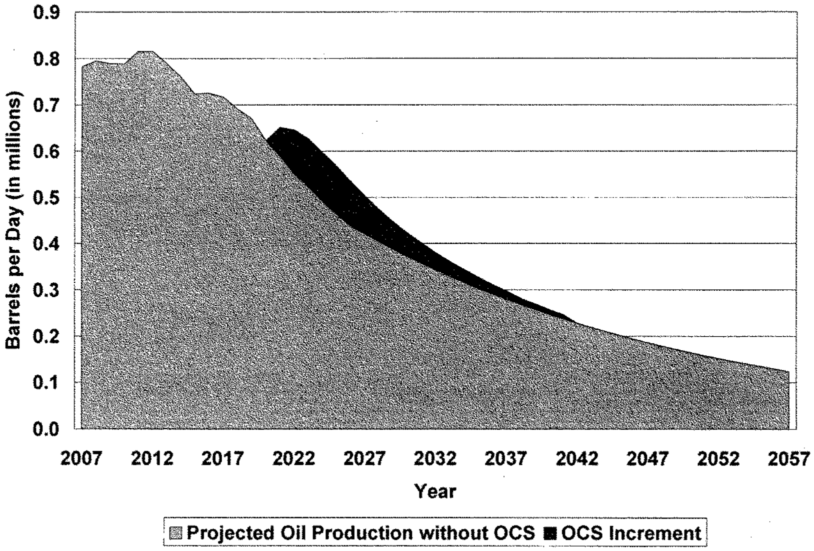
Source: Northern Economics, Inc. and ISER estimates based on scenarios developed for the study.

Figure 19. Incremental Gas Production from Chukchi OCS Development



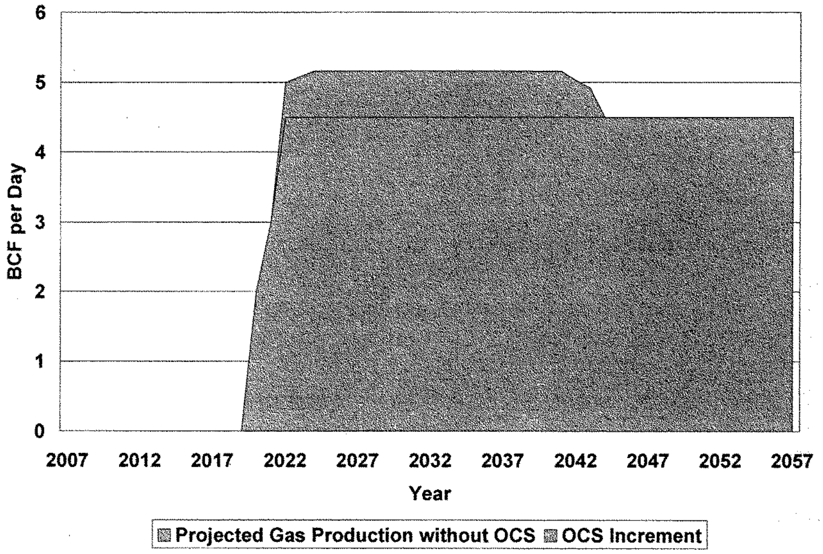
Source: Northern Economics, Inc. and ISER estimates based on scenarios developed for the study.

Figure 20. Incremental Oil Production from North Aleutian Basin OCS Development



Source: Northern Economics, Inc. and ISER estimates based on scenarios developed for the study.

Figure 21. Incremental Gas Production from North Aleutian Basin OCS Development



Source: Northern Economics, Inc. and ISER estimates based on scenarios developed for the study.

4.2 Potential Employment Effects

Exploring, developing, and producing the oil and gas resources off Alaska's coast will require a substantial effort and as a result will directly employ thousands of people in the oil and gas sector, with many more thousands of jobs created in the Alaska economy's infrastructure, support, and government sectors. Table 22 summarizes the annual average employment that might be created if the OCS scenarios (described in Section 3) were to occur. These estimates represent the annual average employment over the entire 50-year period from 2008 to 2057. It should be noted that it could take several years before OCS employment could reach the annual average of 6,000 direct jobs in the oil and gas sector, and for the other sectors to reach the levels indicated in the table. Figure 22 in the next section illustrates the ramp up of the direct employment effects of OCS development over time.

The direct jobs are the oil and gas jobs created in the industry and the indirect jobs are the jobs created in all the other categories (Section 4.2.1 defines these job categories in more detail). The roughly 6,000 direct jobs in oil and gas and the revenues associated with production could create an additional 29,000 jobs in other sectors of the state's economy. Thus, each oil and gas job helps create an additional 4.8 jobs in the economy. The estimated increase of 35,000 jobs would represent about an 11 percent increase over the 2007 statewide annual average employment.

Table 22. Estimated Direct and Indirect Employment Effects by Sector for All Three OCS Areas (expressed as Annual Average from 2008 to 2057)

Sector	Number of Jobs
Oil and Gas (extraction and oilfield services)	6,000
Infrastructure	3,000
Support	22,000
State/Local Government	4,000
Total	**35,000**

Sources: Northern Economics, Inc. estimates derived from modified MMS IMPAK models, and ISER estimates from MAP model.

The potential employment effects discussed in the following subsections include:

- Definition of the employment categories used in this analysis
- Description of the direct employment activities involved in OCS development
- Discussion of direct employment results
- Discussion of the total number of jobs (direct and indirect) by place of work and by place of residence for each OCS area, for the North Slope region, and for all three OCS areas combined.

4.2.1 Definition of Employment Categories

Direct employment includes all the jobs in the oil and gas sector involved in OCS exploration, development, and production activities. Direct employment is comprised of on-site and off-site workers.

On-site workers are those engaged in exploration, development, and production activities at each of the OCS locations. On-site jobs fall under three major types of activities: 1) construction and operation of onshore facilities; 2) operation and drilling of production platforms and wells; and 3) operation and drilling of exploration platforms and wells.

Off-site workers include employees working in the oil and gas company headquarters as well as those involved in the pipe coating activities. The headquarters jobs are estimated at 15 percent of total on-site jobs. This percentage is consistent with the historical average for Anchorage oil and gas employment compared to statewide oil and gas employment excluding Anchorage. These headquarters jobs are assumed to be located in Anchorage. Pipe-coating jobs are assumed to be located in Fairbanks.

Indirect employment includes jobs in other sectors of the economy that provide goods and services to support OCS exploration, development and production. Indirect jobs fall under three major sectors:

- **Infrastructure employment.** This consists of workers in the transportation, communications, public utilities, and business services industries that work closely with the petroleum industry.
- **Support** employment. This includes all other private sector workers in trade, services, and related businesses. These businesses provide goods and services both to other Alaska businesses as well as Alaska households.

- **State and local government employment (including federal jobs).** State and local government employment growth is based on the assumption that all revenues from OCS activity will be spent on services for both new and existing residents[12].

Employment effects are also expressed as jobs by ***Place of Work*** and by ***Place of Residence***.

Employment by *place of work* includes all jobs held by both Alaska residents and non-residents working in various locations in Alaska. This category does not include the jobs associated with building the modules or pipes that are imported from Outside Alaska or any other job done outside of Alaska even if the jobs are associated with Alaska OCS development.

Employment by *place of residence* distinguishes jobs according to five locations that include Local (residents of the North Slope Borough or the Aleutians region), Anchorage, Fairbanks, Other Alaska Resident, and Non-Resident. It is uncertain if OCS employment will have the same residency characteristics as current oil and gas industry employment, but other data have not been identified that would support other assumptions. Therefore, for this analysis historic percentages of employment by residency are used (see Table 23 for share of workers by place of residence).

Table 23. Historical Percentage of Oil and Gas Sector Jobs by Place of Residence

Place of Residence	Percent of Direct Employment
Local	0.5
Anchorage	47.0
Fairbanks	6.0
Other Alaska Resident	21.1
Non-resident	25.4

Source: Northern Economics, Inc. analysis

4.2.2 Potential Direct Employment Effects

Based on the scenarios described in Section 3, OCS development in the Beaufort, Chukchi, and the North Aleutian could directly generate an estimated annual average employment of about 6,000 jobs in the oil and gas sector over the course of 50 years (2008 to 2057). These are direct jobs[13] (both on-site and off-site) that could be involved in exploration activities, construction of offshore and onshore production and transportation facilities, spill prevention, logistics, and operations and maintenance activities in all three OCS areas. The estimated 6,000 direct jobs for OCS activity in the three basins represent roughly 48 percent of the 2007 oil and gas employment of 12,600 (ADOLWD, 2008).

Figure 22 shows the potential direct annual average employment in the oil and gas industry that might result from OCS development in all three areas across time. The growth in employment in the next decade associated with OCS development could offset the decline in petroleum employment associated with the decline in oil production on state lands and maintain employment levels after the construction of the gas pipeline. Subsequently, for about 2 decades, employment could be relatively stable as fields are developed and produced over that period. Eventually, direct employment will decline as production declines and fields are abandoned. As noted earlier, this is just one possible development pattern; OCS development could occur in different locations and different times. The development of multiple fields could tend to smooth out any boom and bust phenomenon.

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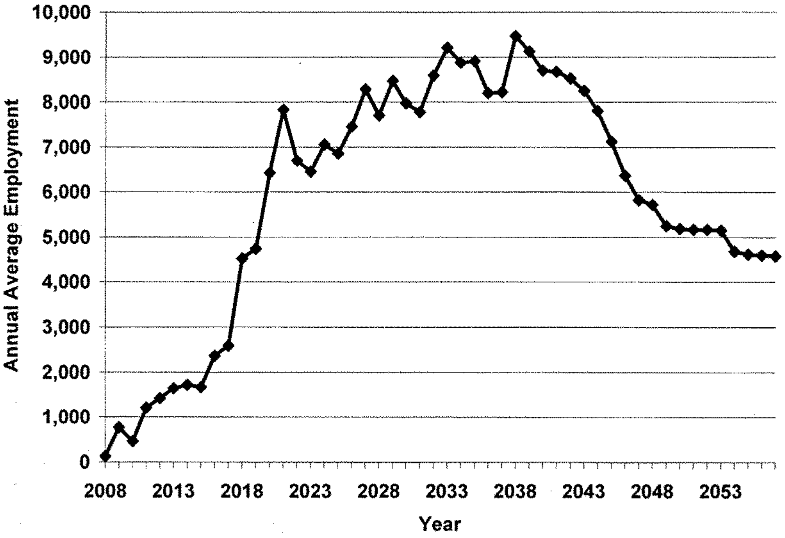
[12] Different assumptions regarding how and when public revenues from OCS development are spent would yield somewhat different employment and population impacts.

[13] These direct employment estimates do not include jobs involved in building modules outside of Alaska, but do include non-resident jobs involved in installing pre-fabricated modules at the site. On-site facilities include the onshore and offshore facilities.

Figure 22. Total Annual Average Direct Employment for All Three OCS Areas, 2008-2057



Source: Estimates by Northern Economics, Inc. from modified MMS IMPAK model.

Peak employment across all OCS areas based on the scenarios presented in Section 3 could occur in 2038 with an estimated annual average employment of about 9,500; the peaking occurs when major discoveries are being developed and facility construction is underway. In the North Aleutian OCS development scenario, employment is highest in year 2018. Generally, because of the scale of potential resource development in the Beaufort and the Chukchi OCS areas, employment effects in these areas are higher compared to the North Aleutian Basin.

Table 24 shows the potential direct employment effects that could result from oil and gas development in each of the OCS areas. As noted earlier, the average employment over the entire period could be about 48 percent of the 12,600 oil and gas-related employment in 2007. Peak OCS employment in 2038 could be about 75 percent of 2007 petroleum-related employment.

Table 24. Annual Average Direct Employment by OCS Area, 2008-2057

	Beaufort	Chukchi	North Aleutian	All Areas
Annualized Average				
Entire time frame	2,800	2,500	900	6,000
Production phase	3,300	3,000	1,100	7,100
Peak Employment	4,800	4,200	2,200	9,500
Year of Peak Employment	*2027*	*2038*	*2018*	*2038*

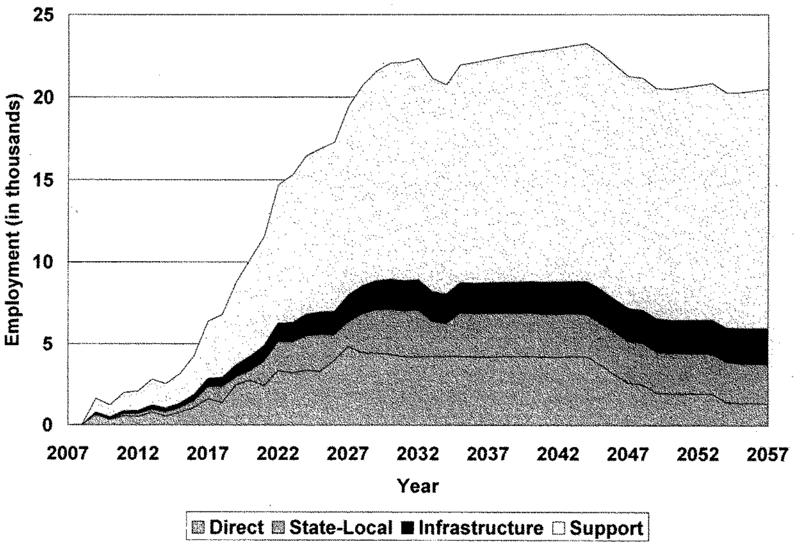
Source: Northern Economics Inc. estimates derived from modified MMS IMPAK models.

Note: Employment estimates are rounded.

4.2.3 Potential Employment Effects of the Beaufort OCS Development

Total Alaska employment (wage and salary jobs plus self employed) associated with Beaufort OCS development by category is shown in Figure 23. The figure represents the incremental employment over and above the base case with no OCS development. Direct jobs peak at about 5,000 in 2027 and total employment continues to increase until field production ceases and fields are abandoned.

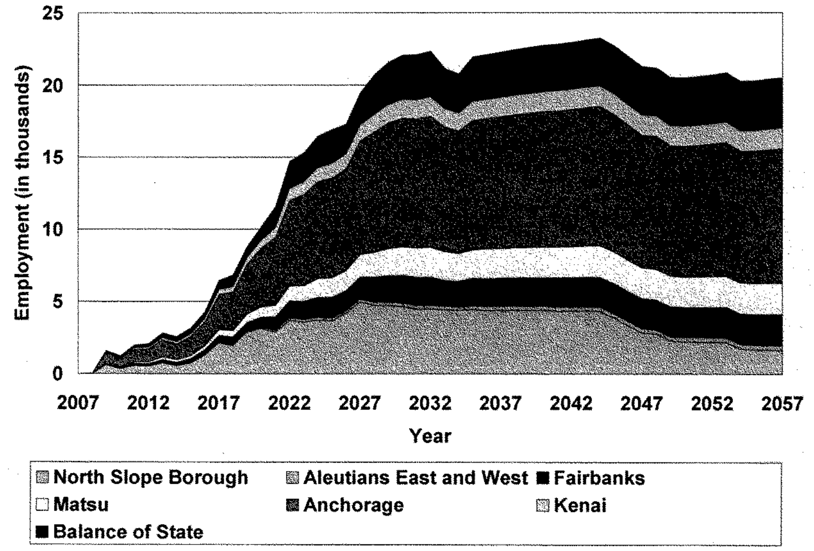
Figure 23. Estimated Incremental Employment by Sector, Beaufort OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Figure 24 shows the regional breakdown of Alaska employment by place of work associated with Beaufort OCS development. Direct employment is mostly located in the North Slope Borough, with a few direct off-site jobs in Anchorage and Fairbanks. The infrastructure and support employment are distributed throughout the state because most of the direct employees live in Southcentral Alaska and other parts of the state. Local government employment is also concentrated in the North Slope Borough, although it increases wherever new workers live. State government employment also increases wherever new workers live.

Figure 24. Estimated Incremental Employment by Place of Work, Beaufort OCS Development

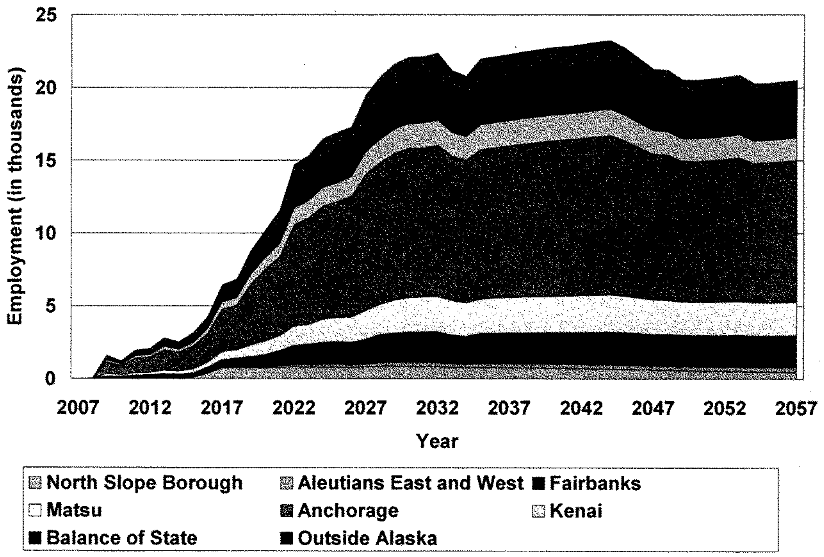


Source: Northern Economics, Inc. and ISER estimates.

Note: Fairbanks is the Fairbanks North Star Borough; Anchorage is the Municipality of Anchorage; Aleutians East and West is comprised of the Aleutians East Borough, Aleutians West Census Area, Bristol Bay Borough, Dillingham Census Area, and Lake and Peninsula Borough; Matsu is the Matanuska-Susitna Borough; Kenai is the Kenai Peninsula Borough.

Figure 25 shows the incremental statewide employment associated with Beaufort Sea OCS development by place of residence. This figure shows total (direct and indirect) employment for areas within the state. Outside of Alaska estimates are for direct employment only. Anchorage captures about half of all employment, which is similar to its 47 percent share of statewide 2007 employment. The Fairbanks North Star Borough and the Matanuska-Susitna Borough also capture significant shares of total incremental employment associated with the OCS development.

Figure 25. Estimated Incremental Employment by Place of Residence, Beaufort OCS Development



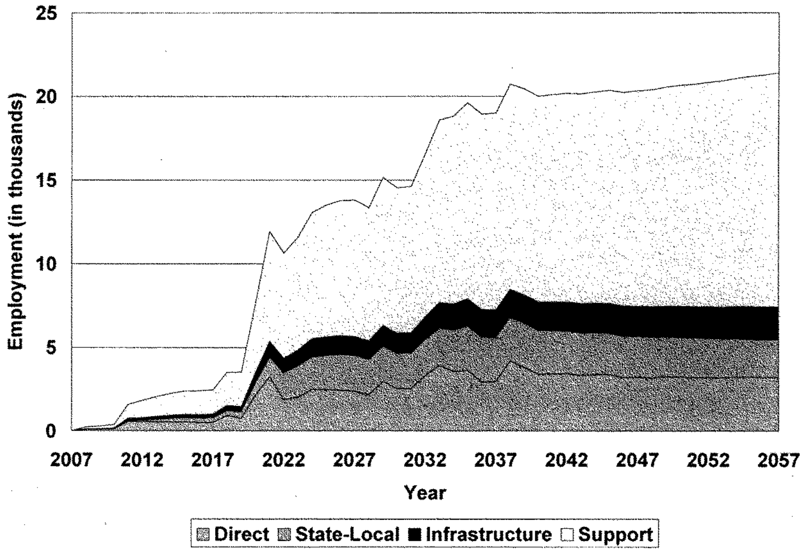
Source: Northern Economics, Inc. and ISER estimates.

Note: Fairbanks is the Fairbanks North Star Borough; Anchorage is the Municipality of Anchorage; Aleutians East and West is comprised of the Aleutians East Borough, Aleutians West Census Area, Bristol Bay Borough, Dillingham Census Area, and Lake and Peninsula Borough; Matsu is the Matanuska-Susitna Borough; Kenai is the Kenai Peninsula Borough.

4.2.4 Potential Employment Effects of the Chukchi OCS Development

Total Alaska employment (wage and salary jobs plus self employed) associated with Chukchi OCS development by sector is shown in Figure 26. It represents the incremental employment over and above the case with no OCS development. The employment generated by OCS development in the Chukchi Sea is almost as large as the employment for OCS activity in the Beaufort Sea even though the number of fields is greater in the Beaufort Sea OCS. There is limited infrastructure on the Chukchi Sea coast and so more facilities will be needed to develop the Chukchi Sea OCS resources. Construction of these additional facilities generates a substantial number of jobs.

Figure 26. Estimated Incremental Employment by Sector, Chukchi OCS Development

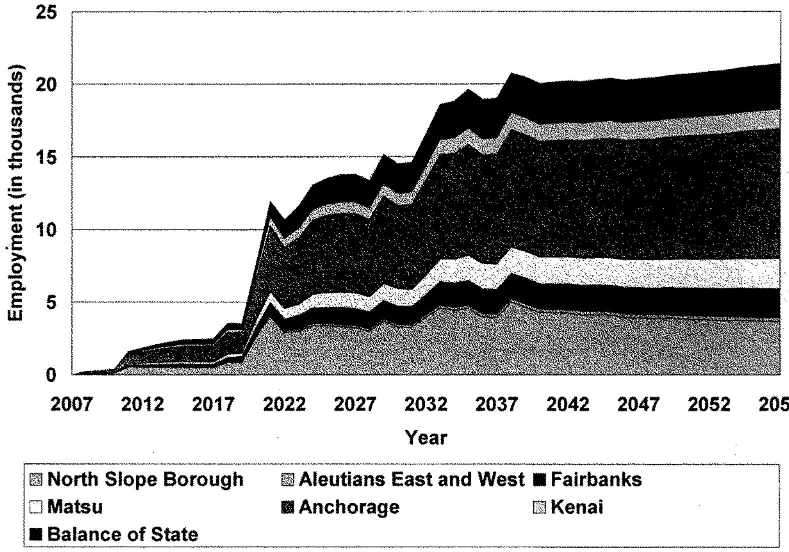


Source: Northern Economics, Inc. and ISER estimates.

The direct and infrastructure employment levels remain fairly stable following completion of the construction and development phases of the scenario for the Chukchi Sea as all of the fields remain in production during the study period. State and local government and the support sector jobs are affected by the revenues generated by oil production activities and although these two sectors do contract some after development is completed, they continue to expand as production and revenues increase.

Figure 27 shows the regional breakdown of Alaska employment associated with Chukchi OCS development. The direct employment is mostly located in the North Slope Borough with some jobs located in Anchorage and Fairbanks. The infrastructure and support employment are distributed throughout the state because most of the direct employees live in Southcentral, Alaska and other parts of the state. Local government employment is also concentrated in the North Slope Borough, although it increases wherever new workers live. State government employment also increases wherever new workers live.

Figure 27. Estimated Incremental Employment by Place of Work, Chukchi OCS Development

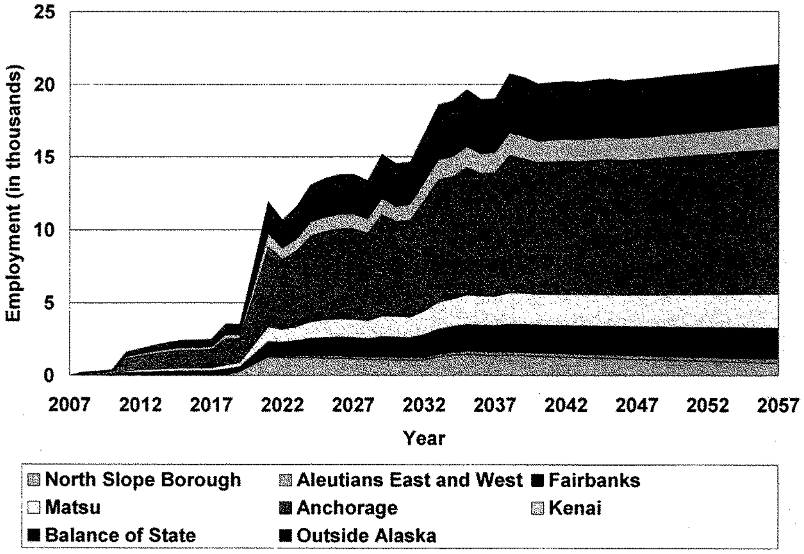


Source: Northern Economics, Inc. and ISER estimates.

Note: Fairbanks is the Fairbanks North Star Borough; Anchorage is the Municipality of Anchorage; Aleutians East and West is comprised of the Aleutians East Borough, Aleutians West Census Area, Bristol Bay Borough, Dillingham Census Area, and Lake and Peninsula Borough; Matsu is the Matanuska-Susitna Borough; Kenai is the Kenai Peninsula Borough.

Figure 28 shows the incremental statewide employment associated with the Chukchi Sea OCS development by place of residence. This figure shows total (direct and indirect) employment for areas within the state. Outside of Alaska estimates are for direct employment only. Total employment exceeds 22,000 by the end of the study period.

Figure 28. Incremental Employment by Place of Residence, Chukchi OCS Development



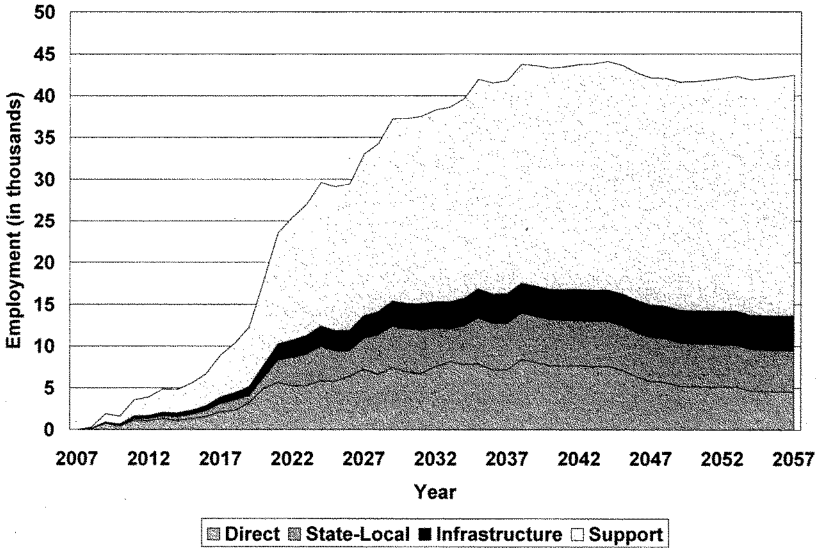
Source: Northern Economics, Inc. and ISER estimates.

Note: Fairbanks is the Fairbanks North Star Borough; Anchorage is the Municipality of Anchorage; Aleutians East and West is comprised of the Aleutians East Borough, Aleutians West Census Area, Bristol Bay Borough, Dillingham Census Area, and Lake and Peninsula Borough; Matsu is the Matanuska-Susitna Borough; Kenai is the Kenai Peninsula Borough.

4.2.5 Potential Employment Effects in the North Slope: Combined Beaufort and Chukchi OCS Activities

Total Alaska employment (wage and salary jobs plus self employed) associated with combined Beaufort and Chukchi development by sector is shown in Figure 29. It represents the incremental employment over and above the case with no OCS development. The employment estimates shown below represent the sum of the employment for the Beaufort and Chukchi OCS scenarios.

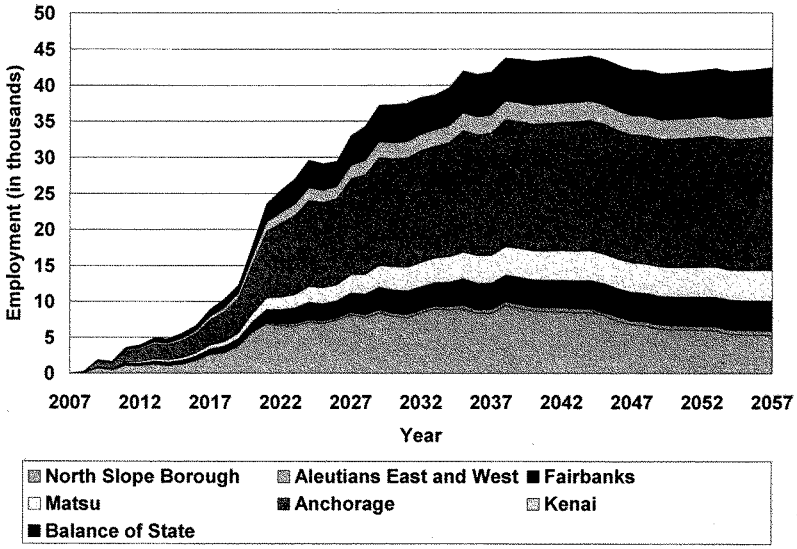
Figure 29. Estimated Incremental Employment, Beaufort and Chukchi OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Figure 30 shows the regional breakdown of Alaska employment associated with Beaufort and Chukchi OCS development. The direct employment is mostly located in the North Slope Borough. The infrastructure and support employment are distributed throughout the state because most of the direct employees live in Southcentral, Alaska and other parts of the state. Local government employment is also concentrated in the North Slope Borough, although it increases wherever new workers live. State government employment also increases wherever new workers live.

Figure 30. Estimated Incremental Employment by Place of Work, Beaufort and Chukchi OCS Development

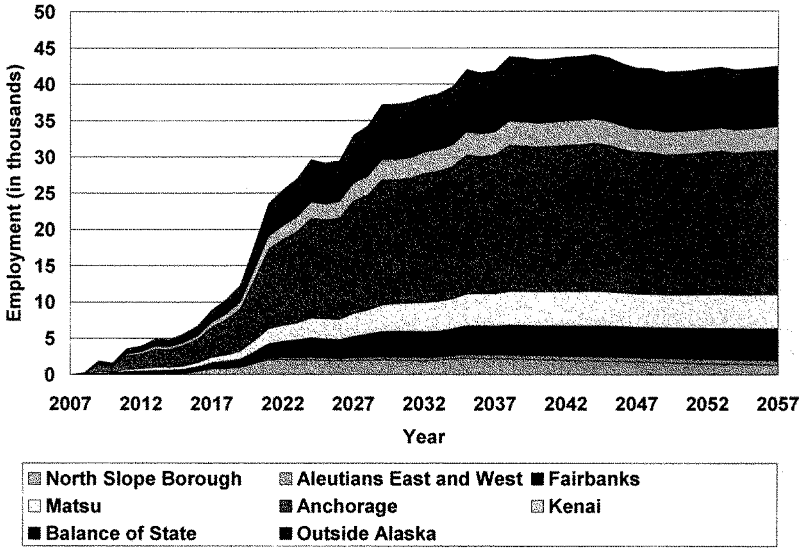


Source: Northern Economics, Inc. and ISER estimates.

Note: Kenai is the Kenai Peninsula Borough; Anchorage is the Municipality of Anchorage; Matsu is the Matanuska-Susitna Borough; Fairbanks is the Fairbanks North Star Borough; Aleutians East and West is comprised of the Aleutians East Borough, Bristol Bay Borough, Lake and Peninsula Borough, Aleutians West Census Area, and Dillingham Census Area.

Figure 31 shows the incremental statewide employment associated with the Beaufort and Chukchi Sea OCS development by place of residence. This figure shows total (direct and indirect) employment for areas within the state. Outside of Alaska estimates are for direct employment only. Total employment for the two OCS areas peaks at about 44,000 and exceeds 40,000 at the end of the study period.

Figure 31. Estimated Incremental Employment by Place of Residence, Beaufort and Chukchi OCS Development



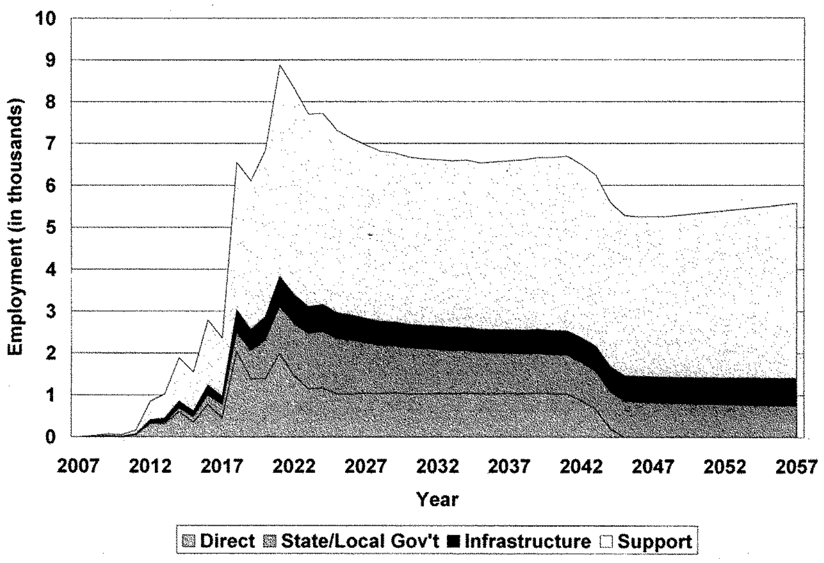
Source: Northern Economics, Inc. and ISER estimates.

Note: Fairbanks is the Fairbanks North Star Borough; Anchorage is the Municipality of Anchorage; Aleutians East and West is comprised of the Aleutians East Borough, Aleutians West Census Area, Bristol Bay Borough, Dillingham Census Area, and Lake and Peninsula Borough; Matsu is the Matanuska-Susitna Borough; Kenai is the Kenai Peninsula Borough.

4.2.6 Potential Employment Effects of the North Aleutian OCS Development

Total Alaska employment (wage and salary jobs plus self employed) associated with North Aleutian Basin OCS development by category is shown in Figure 32. It represents the incremental employment over and above the case with no OCS development. The decline in direct employment following the development phase is evident in the figure. The figure also shows the relatively level employment for the direct and infrastructure sectors during production. The state and local government employment and support sector employment declines over time due to the decline in production which affects state and local government revenues and associated jobs in those sectors.

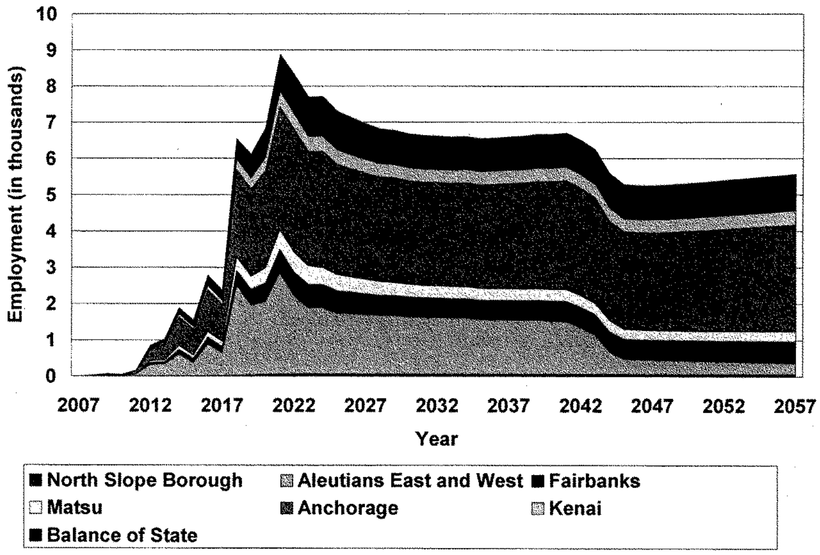
Figure 32. Estimated Incremental Employment, North Aleutian Basin OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Figure 33 shows the regional breakdown of Alaska employment associated with North Aleutian OCS development. The direct employment is mostly located in the Aleutians region. The infrastructure and support employment are distributed throughout the state because most of the direct employees would live in Southcentral, Alaska and other parts of the state. Local government employment is also concentrated in the region, although it increases wherever new workers live. State government employment also increases wherever new workers live. Peak employment is almost 9,000 and even after the fields are depleted, related employment could still be over 5,000 due to the development of additional businesses that could continue even without the oil and gas industry.

Figure 33. Estimated Incremental Employment by Place of Work, North Aleutian Basin OCS Development

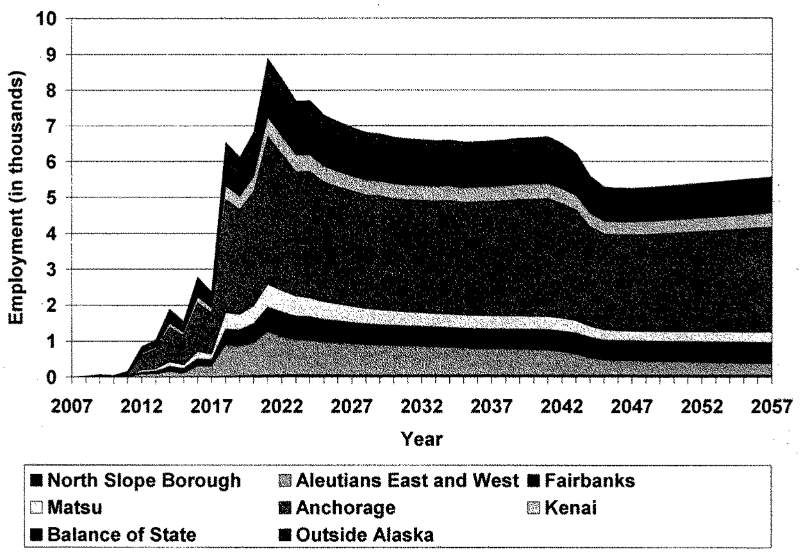


Source: Northern Economics, Inc. and ISER estimates.

Note: Kenai is the Kenai Peninsula Borough; Anchorage is the Municipality of Anchorage; Matsu is the Matanuska-Susitna Borough; Fairbanks is the Fairbanks North Star Borough; Aleutians is comprised of the Aleutians East Borough, Bristol Bay Borough, Lake and Peninsula Borough, Aleutians West Census Area, and Dillingham Census Area; NS Borough is the North Slope Borough.

Figure 34 shows the incremental statewide employment associated with the North Aleutian Basin OCS development by place of residence. This figure shows total (direct and indirect) employment for areas within the state. Outside of Alaska estimates are for direct employment only.

Figure 34. Estimated Incremental Employment by Place of Residence, North Aleutian Basin OCS Development



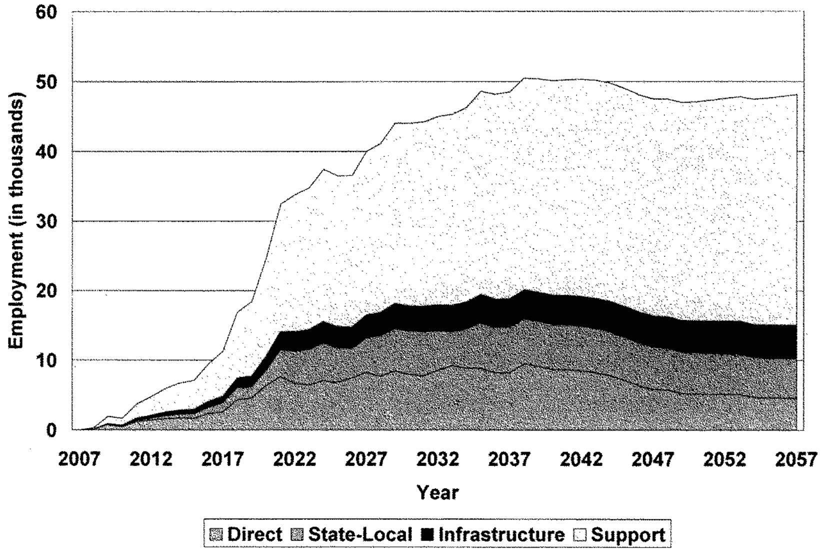
Source: Northern Economics, Inc. and ISER estimates.

Note: Fairbanks is the Fairbanks North Star Borough; Anchorage is the Municipality of Anchorage; Aleutians East and West is comprised of the Aleutians East Borough, Aleutians West Census Area, Bristol Bay Borough, Dillingham Census Area, and Lake and Peninsula Borough; Matsu is the Matanuska-Susitna Borough; Kenai is the Kenai Peninsula Borough.

4.2.7 Potential Total Statewide Employment Effects: All Three OCS Development

Total Alaska employment (wage and salary jobs plus self employed) associated with OCS development in the Beaufort, Chukchi, and the North Aleutian Basin by sector is shown in Figure 35. It represents the incremental employment over and above the status quo case with no OCS development. The peak of about 50,000 additional employment would be an increase of about 16 percent over 2007 wage and salary employment and about 11 percent over total employment, including the self-employed in 2007 (Bureau of Economic Analysis, 2008).

Figure 35. Estimated Incremental Employment: Beaufort, Chukchi, and North Aleutian Basin OCS Development



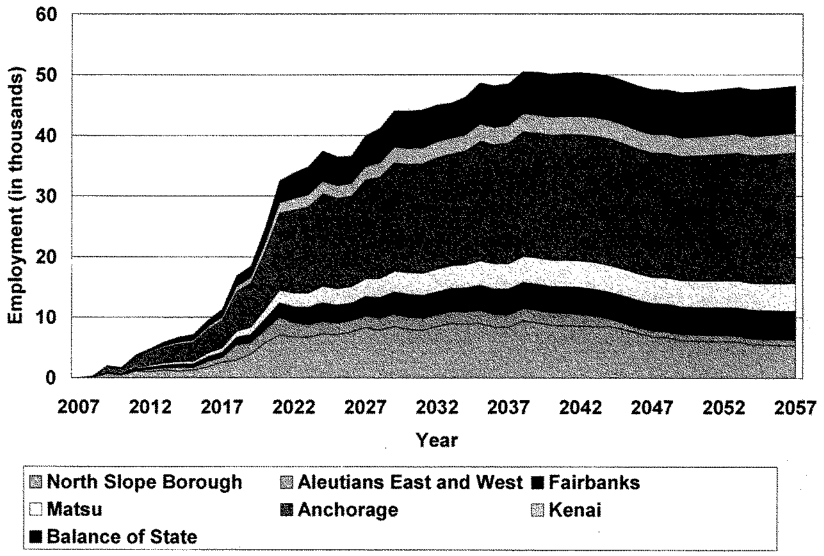
Source: Northern Economics, Inc. and ISER estimates.

Figure 36 and Figure 37 show the regional breakdown of Alaska employment associated with the development of all 3 OCS areas by place of work and by place of residence, respectively.

Direct employment would mostly be located in the North Slope and in the Aleutians. The infrastructure and support employment are distributed throughout the state because most of the direct employees live in Southcentral Alaska and other parts of the state. Local government employment would also be concentrated in the North Slope and Aleutians regions, although local government increases wherever new workers live. State government employment also increases wherever new workers live.

Population change would occur with changes in employment by place of residence. Because much of the direct and infrastructure workforce on the North Slope and Aleutians regions would live in Southcentral, Alaska, the incremental population is primarily concentrated there. Incremental population is slightly less than incremental employment because a small share of direct employment is non-resident. The following sub-section discusses the population effects of OCS development in Alaska.

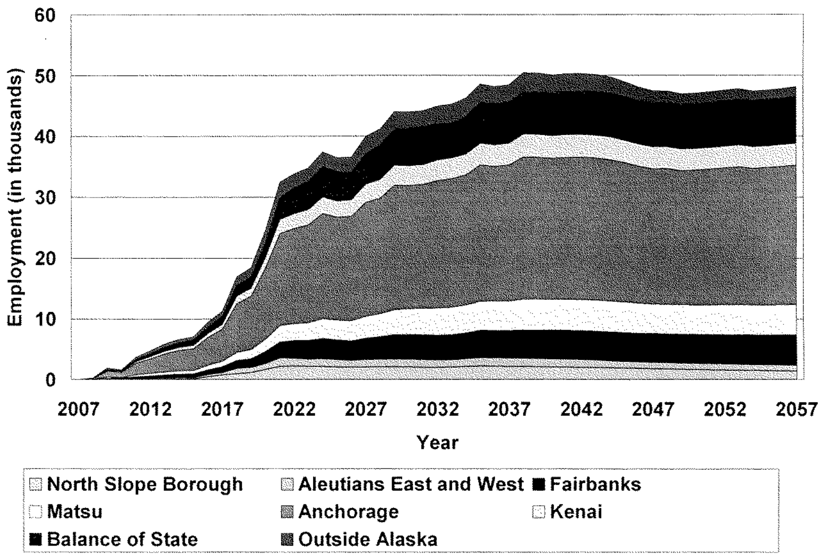
Figure 36. Estimated Incremental Employment by Place of Work: Beaufort, Chukchi, and North Aleutian Basin OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Note: Fairbanks is the Fairbanks North Star Borough; Anchorage is the Municipality of Anchorage; Aleutians East and West is comprised of the Aleutians East Borough, Aleutians West Census Area, Bristol Bay Borough, Dillingham Census Area, and Lake and Peninsula Borough; Matsu is the Matanuska-Susitna Borough; Kenai is the Kenai Peninsula Borough.

Figure 37. Estimated Incremental Employment by Place of Residence: Beaufort, Chukchi, and North Aleutian Basin OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Note: Fairbanks is the Fairbanks North Star Borough; Anchorage is the Municipality of Anchorage; Aleutians East and West is comprised of the Aleutians East Borough, Aleutians West Census Area, Bristol Bay Borough, Dillingham Census Area, and Lake and Peninsula Borough; Matsu is the Matanuska-Susitna Borough; Kenai is the Kenai Peninsula Borough.

4.3 Potential Statewide Population Effects

The Alaska labor market does not have the capacity to supply all the workers needed to fill the jobs that could be created by OCS activity. Although some of the new jobs could be filled by the growing Alaska labor force, many could be taken by new migrants to the state and this would increase the Alaska population.

This is consistent with the historical pattern of population growth. Each year a significant share of the population leaves the state, only to be replaced by an almost equal number of new residents. In years of rapid growth of employment opportunities, the number of people moving into the state will outnumber those who leave, and this will result in an increase in the total population of the state. In years of slow or negative employment growth the number of people who migrate from the state will outnumber newcomers and total population will either grow more slowly (due to natural increase) or actually fall.

Because migrants seeking jobs often have families, the population effect of OCS development would increase the size of the working adult population and the number of dependents—infants, children, adults not in the labor force, and even senior citizens. Often a family will include more than one adult in the labor force. In those cases, one new family can account for more than one of the new jobs created by OCS activity.

Two factors beyond the size and composition of families are important in determining the population response to new employment opportunities. The first is the share of new jobs taken by nonresidents who come to the state to work, but continue to reside outside of Alaska, a practice that has been common in the petroleum industry. It is assumed in this study that a share of the direct jobs in OCS exploration, development, and production will be filled by these commuting nonresidents, but that the other jobs generated by OCS activity (infrastructure, support, and government) will be filled by residents, including new migrants. Obviously the larger the nonresident share of new workers, the smaller will be the population impact of OCS development.

The second is the presence of an under-utilized Alaska labor force. The Alaska unemployment rate has historically been higher than the national average, in part because job opportunities are more concentrated in urban Alaska than the population, and in part because the labor force participation among Alaska Natives is low. To the extent that policies were in place that brought more of these potential Alaska workers into the work force, the need to attract new workers from outside the state would be reduced and the population impact from OCS development could be reduced. In this analysis, the assumption is that there is no change from the historical relationship between the unemployment rates in Alaska and the U.S. average.

The potential population effects of OCS development in the Beaufort, Chukchi, and the North Aleutian Basin are discussed in the following sections. These results show the projected change in statewide population resulting from OCS development in each of the three OCS areas. The projected change in the local population of the directly impacted regions—the North Slope Borough and the Aleutians region—is presented in a separate section (Section 4.4).

To illustrate the magnitude of the potential increase in population, the incremental change due to OCS development is compared against the statewide baseline population projection without OCS development. The baseline statewide population projection reflects the effects of births, deaths, and migration that correspond with the economic growth assumptions discussed earlier. The results below show that OCS development is not anticipated to create a substantial increase in statewide population relative to the baseline population growth. The implication of this result is that the estimated increase in population due OCS development is not anticipated to create a disproportionate burden on the state to provide public services to the new population.

4.3.1 Beaufort OCS

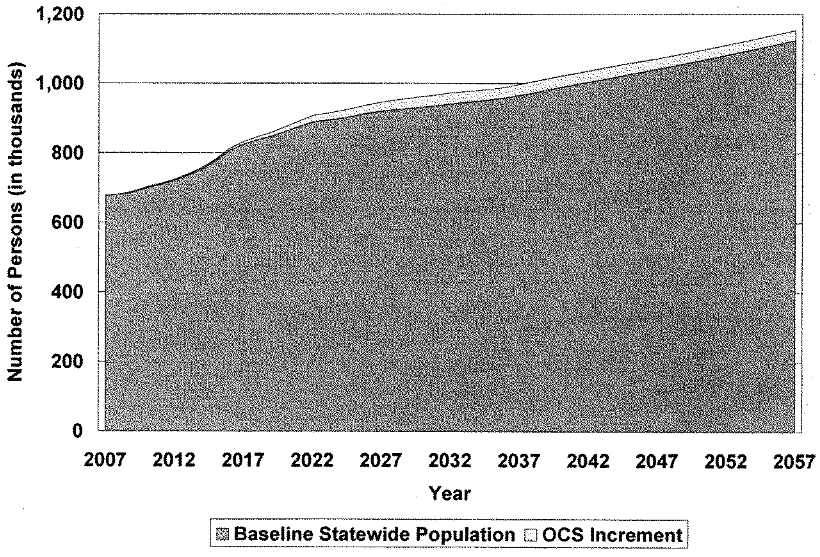
OCS development in the Beaufort Sea is anticipated to add modestly to the total population of the state, as shown in Figure 38. As discussed above, the size of the population impact depends upon the number of jobs generated by OCS development, the capacity of the Alaska labor force to fill those jobs, and the family characteristics of those non-Alaskans who come to the state to fill the jobs not taken by current Alaskans.

The increase in population would be distributed throughout the state (Figure 39), but likely concentrated in the urban areas including the Municipality of Anchorage, the Matanuska-Susitna Borough, the Kenai Peninsula Borough, and the Fairbanks North Star Borough rather than on the North Slope. There are two reasons for this urban concentration. First, although most of the direct OCS jobs would be located in the North Slope Borough, most would be taken by workers living in urban areas and commuting to the work site, as has been the pattern since the development of North Slope petroleum resources began. Second, most of the infrastructure and support jobs associated with

OCS development would be located in the urban areas and it is assumed that these jobs will be filled by residents of urban Alaska.

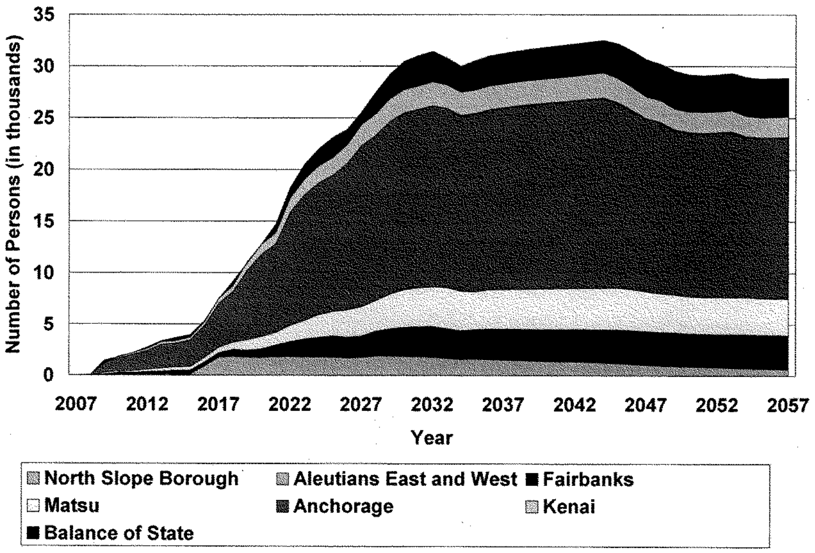
Population growth in the North Slope Borough would result from employment of local residents in direct OCS jobs as well as in infrastructure, support, and government. Population growth in other parts of the state would be related to persons commuting to jobs on the North Slope or Beaufort OCS and government jobs.

Figure 38. Estimated Statewide Population Effects, Beaufort OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Figure 39. Estimated Population Effects by Region, Beaufort OCS Development



Source: Northern Economics, Inc. and ISER estimates.

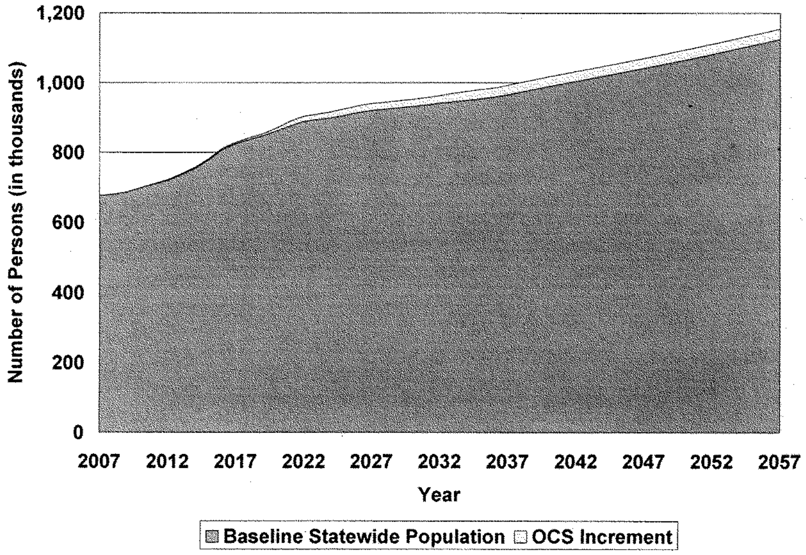
Note: Fairbanks is the Fairbanks North Star Borough; Anchorage is the Municipality of Anchorage; Aleutians East and West is comprised of the Aleutians East Borough, Aleutians West Census Area, Bristol Bay Borough, Dillingham Census Area, and Lake and Peninsula Borough; Matsu is the Matanuska-Susitna Borough; Kenai is the Kenai Peninsula Borough.

4.3.2 Chukchi OCS

As in the Beaufort case, OCS development in the Chukchi is also estimated to add modestly to the total population of the state as shown in Figure 40. As noted above, the size of the population impact depends upon the number of jobs generated by OCS development, the capacity of the Alaska labor force to fill those jobs, and the family characteristics of those non-Alaskans who come to the state to fill the jobs not taken by current Alaskans.

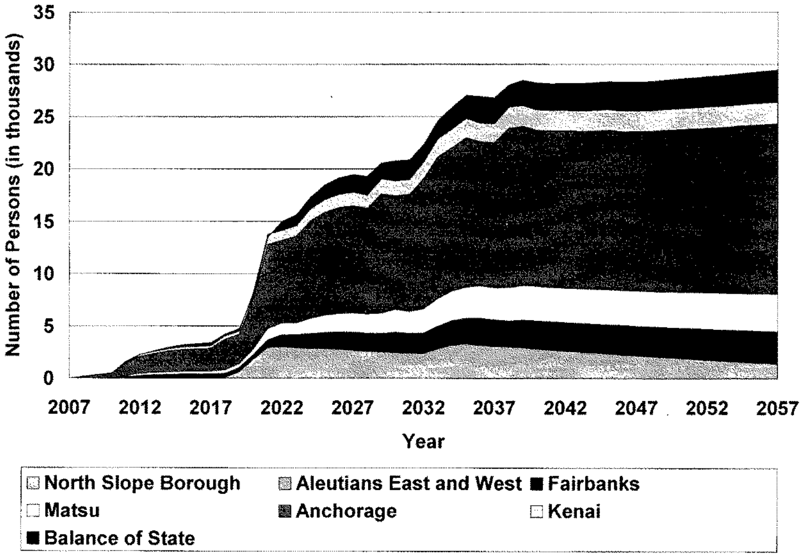
Figure 41 shows the distribution of the additional population throughout the different parts of the state. The figure shows that the additional population is expected to be concentrated not in the North Slope but in the Municipality of Anchorage, Kenai Peninsula Borough, and Fairbanks North Star Borough, where most of the workers are anticipated to reside.

Figure 40. Estimated Statewide Population Effects, Chukchi OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Figure 41. Estimated Population Effects by Region, Chukchi OCS Development



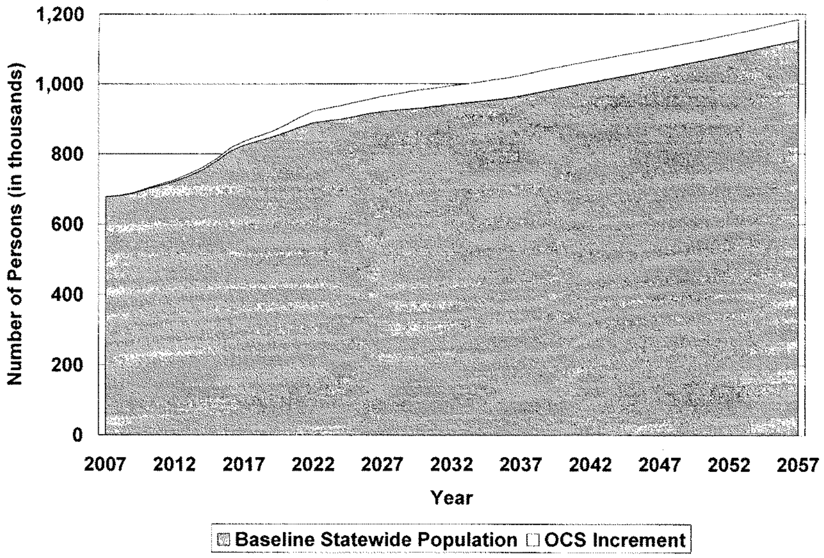
Source: Northern Economics, Inc. and ISER estimates.

Note: Fairbanks is the Fairbanks North Star Borough; Anchorage is the Municipality of Anchorage; Aleutians East and West is comprised of the Aleutians East Borough, Aleutians West Census Area, Bristol Bay Borough, Dillingham Census Area, and Lake and Peninsula Borough; Matsu is the Matanuska-Susitna Borough; Kenai is the Kenai Peninsula Borough.

4.3.3 Combined Beaufort and Chukchi OCS Activity

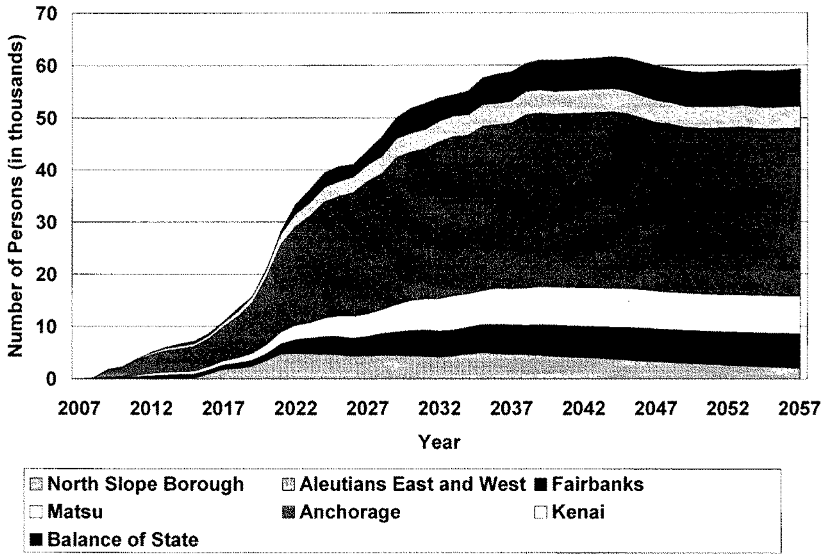
Figure 42 and Figure 43 show the estimated combined population effects of the Beaufort and the Chukchi OCS development. The population effects from OCS development in the North Slope as noted earlier are expected to be modest and most of the additional population would be concentrated in urban areas.

Figure 42. Estimated Statewide Population Effects, Combined Beaufort and Chukchi OCS Activity



Source: Northern Economics, Inc. and ISER estimates.

Figure 43. Estimated Population Effects by Region, Combined Beaufort and Chukchi OCS Activity



Source: Northern Economics, Inc. and ISER estimates.

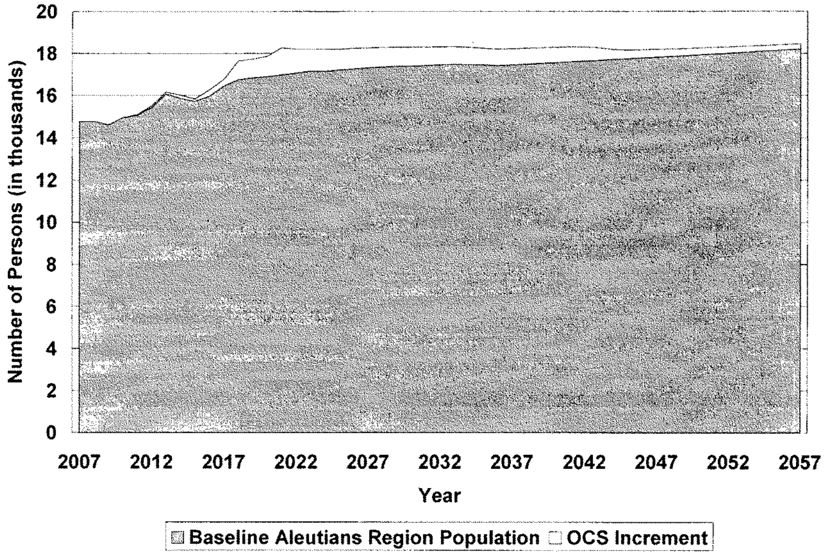
Note: Fairbanks is the Fairbanks North Star Borough; Anchorage is the Municipality of Anchorage; Aleutians East and West is comprised of the Aleutians East Borough, Aleutians West Census Area, Bristol Bay Borough, Dillingham Census Area, and Lake and Peninsula Borough; Matsu is the Matanuska-Susitna Borough; Kenai is the Kenai Peninsula Borough.

4.3.4 North Aleutian OCS

Additional population resulting from OCS development in the North Aleutian Basin is expected to be modest (as shown in Figure 44). Although most of the direct OCS jobs would be located in the North Aleutians Basin, most would be taken by workers living in urban areas and commuting to the work site. Furthermore, since most of the infrastructure and support jobs associated with OCS development would be located in the urban areas, it is assumed that these jobs will be filled by residents of urban Alaska. The distribution of the additional population resulting from OCS development in the North Aleutians is illustrated in Figure 45.

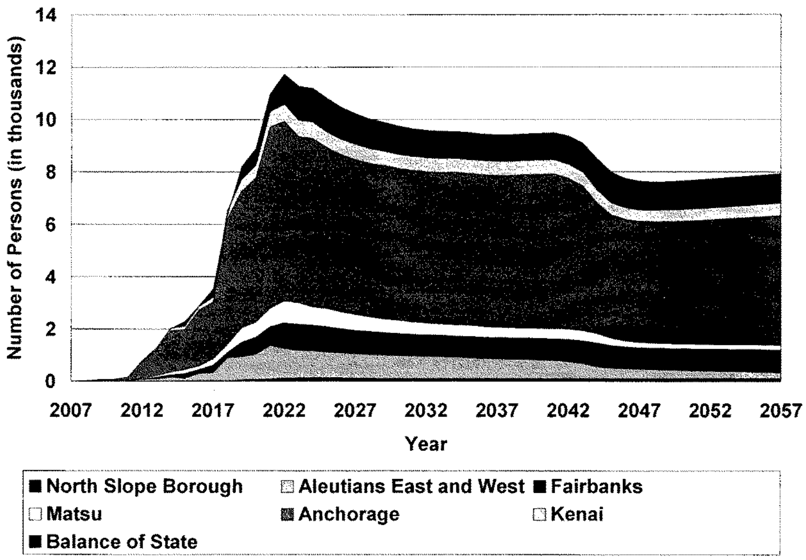
Population growth in the North Aleutian Basin would result from employment of local residents in direct OCS jobs as well as in infrastructure, support, and government. Population growth in other parts of the state would be related to persons commuting to jobs in the North Aleutian Basin region and government jobs.

Figure 44. Estimated Statewide Population Effects, North Aleutian Basin OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Figure 45. Estimated Population Effects by Region, North Aleutian Basin OCS Development



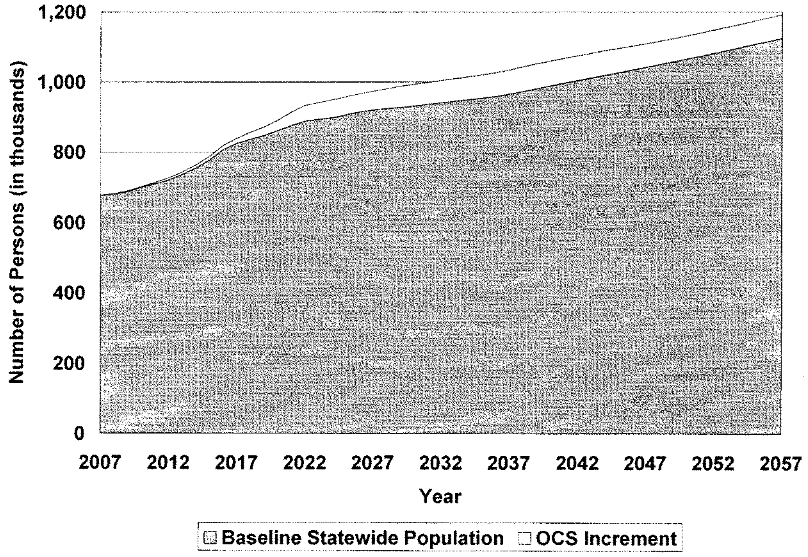
Source: Northern Economics, Inc. and ISER estimates.

Note: Fairbanks is the Fairbanks North Star Borough; Anchorage is the Municipality of Anchorage; Aleutians East and West is comprised of the Aleutians East Borough, Aleutians West Census Area, Bristol Bay Borough, Dillingham Census Area, and Lake and Peninsula Borough; Matsu is the Matanuska-Susitna Borough; Kenai is the Kenai Peninsula Borough.

4.3.5 Total Potential Population Effects: All Three OCS Development

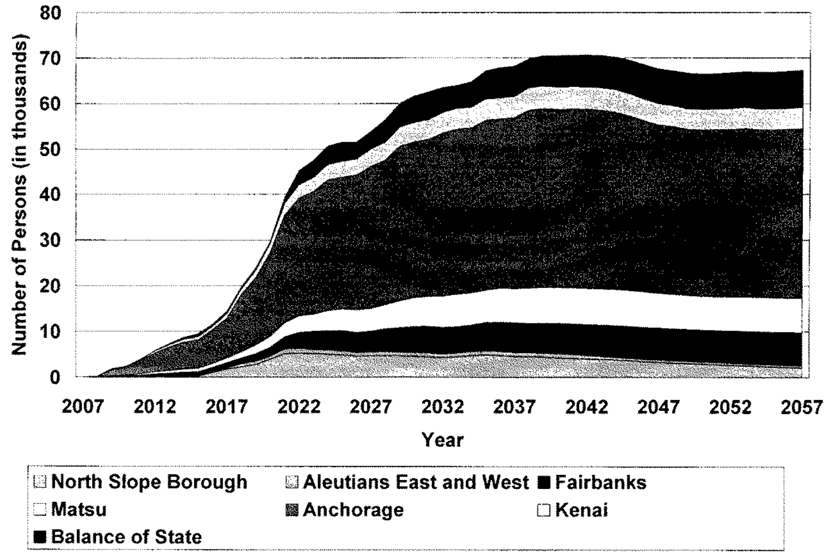
Figure 46 and Figure 47 show the combined population effects of the development of all 3 OCS areas. The increase in statewide population is projected to be modest and most of the new population is expected to be concentrated in urban areas of Alaska.

Figure 46. Estimated Statewide Population Effects: Beaufort, Chukchi, and North Aleutian Basin OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Figure 47. Estimated Population Effects by Region: Beaufort, Chukchi, and North Aleutian Basin OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Note: Fairbanks is the Fairbanks North Star Borough; Anchorage is the Municipality of Anchorage; Aleutians East and West is comprised of the Aleutians East Borough, Aleutians West Census Area, Bristol Bay Borough, Dillingham Census Area, and Lake and Peninsula Borough; Matsu is the Matanuska-Susitna Borough; Kenai is the Kenai Peninsula Borough.

4.4 Potential Local Jobs and Population Effects in Impacted Region

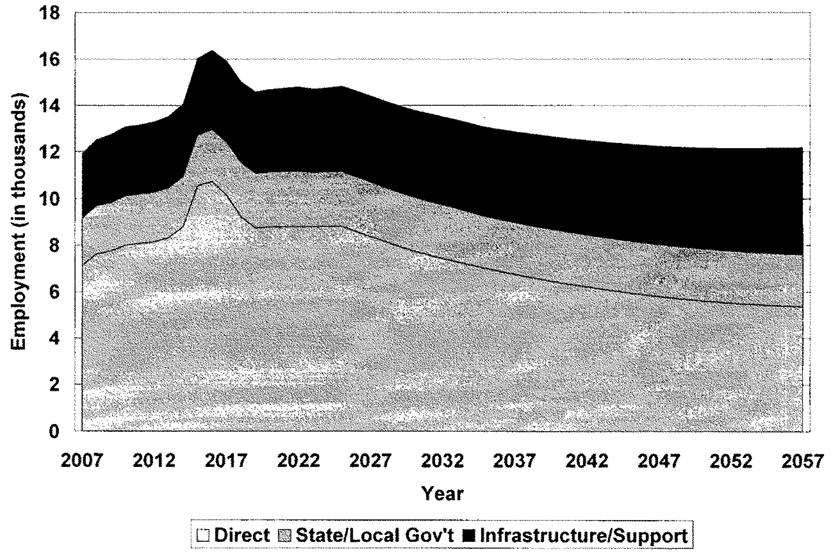
Although most of the job and population growth associated with OCS development would be concentrated in urban Alaska, the impacts would be most significant in the directly impacted onshore regions adjacent to the OCS. Both the North Slope Borough and the North Aleutian Basin regions consist of small and isolated communities with underdeveloped economic structures and small populations. The following sub-sections discuss the local impacts of OCS development for each OCS area.

4.4.1 Beaufort OCS

In the absence of OCS development, employment in the North Slope is projected to grow rapidly in the coming years during the construction of a gas pipeline, and subsequently to slowly trend downward as the pipeline construction boom ends, oil production declines, and the availability of public revenues becomes tighter (Figure 48). Employment is dominated by direct jobs in the oil and gas sector and indirect jobs in the government sector, supported by both state and local revenues. Over time, infrastructure and support jobs become a larger share of the total jobs.

This pattern represents only one possible future scenario for North Slope Borough employment. In particular this pattern of government and support employment assumes that the resident population will remain at least at the current level. However, in recent years out migration from rural Alaska has increased. A continuation of that trend would result in both a smaller population and a smaller number of jobs than projected for the North Slope Borough in this analysis.

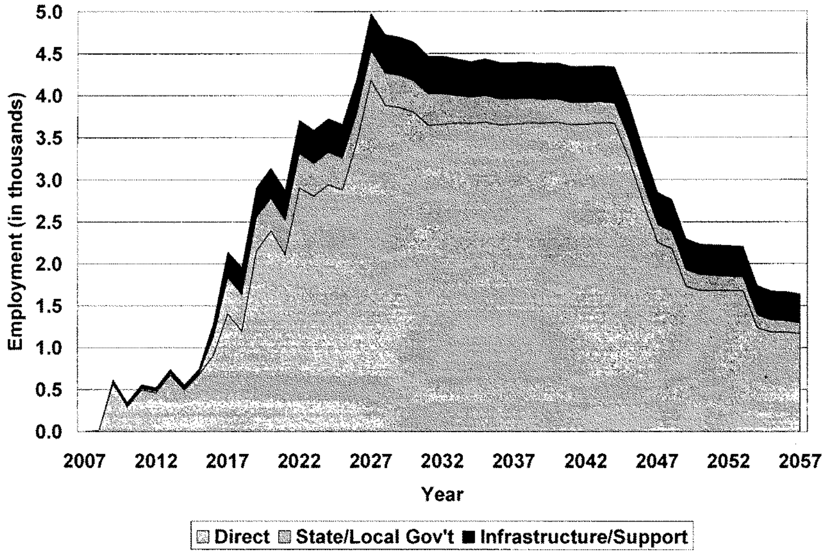
Figure 48. Projected Employment on the North Slope without Beaufort OCS Development



Source: Northern Economics, Inc. and ISER estimates.

The local employment associated with OCS development could expand over a 10 year period, remain relatively stable for the next 20 years, and then decline over the subsequent 10 year period (Figure 49). Most of the jobs would be directly related to oil and gas exploration, development, and production.

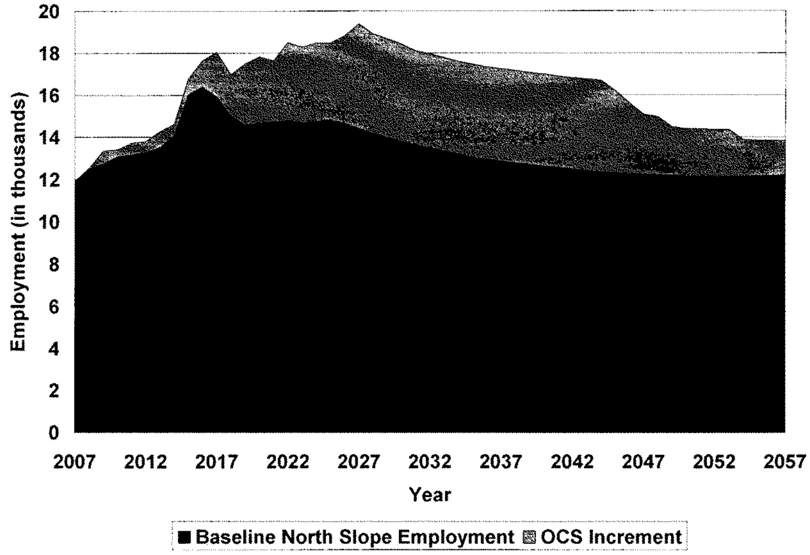
Figure 49. Estimated Incremental Employment on the North Slope with Beaufort OCS Development



Source: Northern Economics, Inc. and ISER estimates.

OCS employment could become significant after the construction of the gas pipeline (Figure 50). It could extend the period of high employment initiated by the pipeline construction for a generation.

Figure 50. Estimated Total Employment on the North Slope with and without Beaufort OCS Development

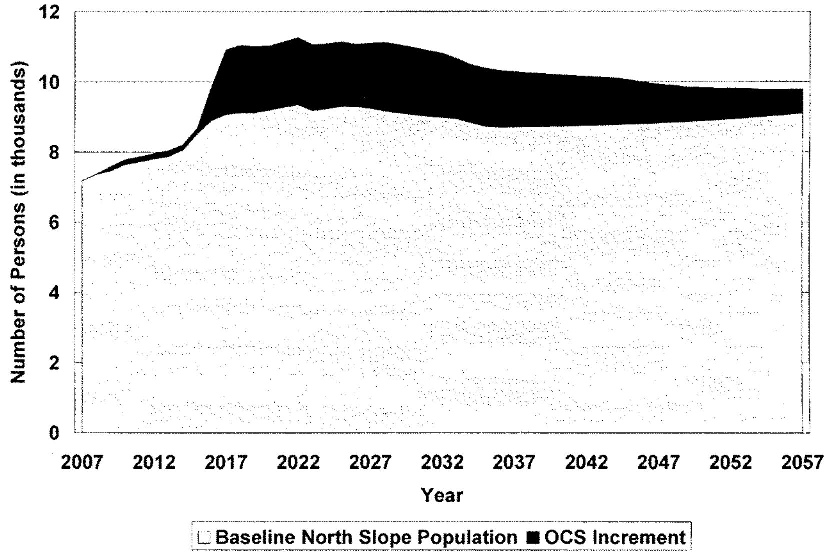


Source: Northern Economics, Inc. and ISER estimates.

The effect of the new employment opportunities provided by OCS development on the population of the region depends on the share of new jobs taken by residents, including new migrants into the region. Consistent with the historical trend, it is assumed that only a small share of the direct jobs are taken by local residents, with the majority going to residents of urban Alaska and non-resident commuters from outside the state. However, all the government, infrastructure, and support jobs are taken by local residents.

The result is a projection of North Slope Borough population as shown in Figure 51. Population growth is rapid during the first years of OCS activity. After that, total population is relatively stable with a slow downward trend as the impact of OCS moderates.

Figure 51. Estimated Local Population Effect, Beaufort OCS Development



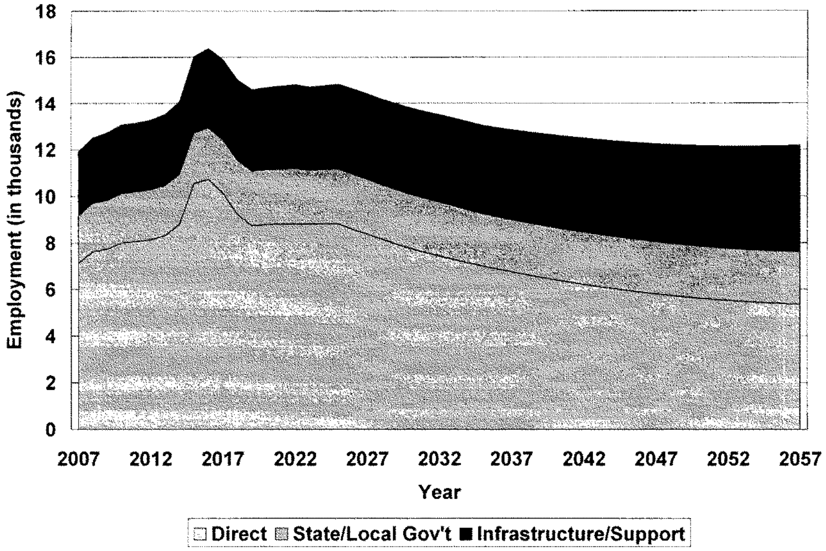
Source: Northern Economics, Inc. and ISER estimates.

4.4.2 Chukchi OCS

As noted above, in the absence of OCS development, employment in the North Slope is projected to grow rapidly in the coming years during the construction of a gas pipeline, and subsequently to slowly trend downward as the pipeline construction boom ends, oil production declines, and the availability of public revenues becomes tighter (Figure 52). Employment is dominated by direct jobs, almost all of which are petroleum related, and government jobs, supported by both state and local revenues. Infrastructure and support jobs become a larger share of the total over time.

This pattern represents only one possible future scenario for North Slope Borough employment. In particular this pattern of government and support employment assumes that the resident population will remain at least at the current level. However, in recent years out migration from rural Alaska has increased. A continuation of that trend could result in both a smaller population and a smaller number of jobs than projected in this study.

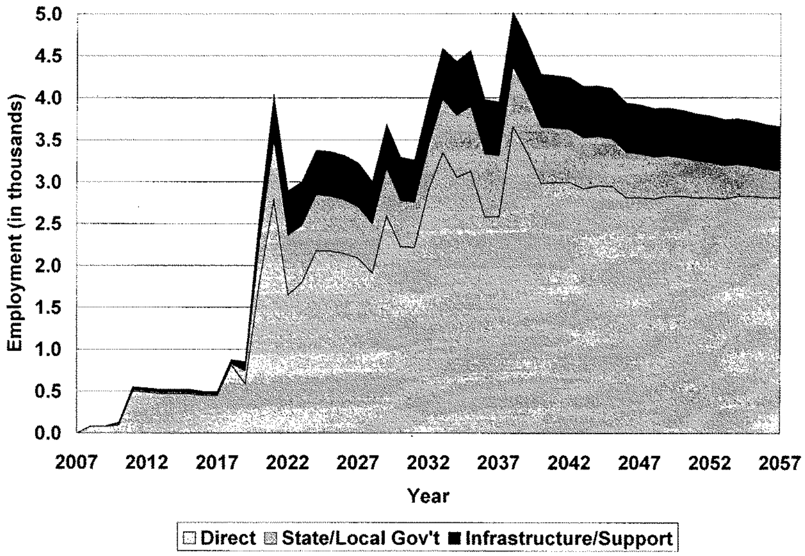
Figure 52. Estimated Employment on the North Slope without Chukchi OCS Development



Source: Northern Economics, Inc. and ISER estimates.

The local employment associated with OCS development could expand rapidly, fluctuate over the next 20 years, and then slowly decline (Figure 53). Most of the jobs would be directly related to oil and gas exploration, development, and production.

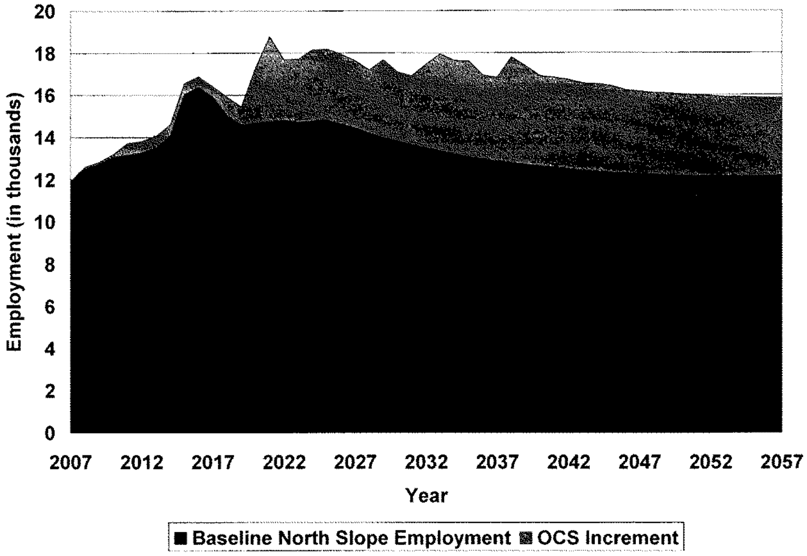
Figure 53. Estimated Incremental Employment on the North Slope with Chukchi OCS Development



Source: Northern Economics, Inc. and ISER estimates.

The OCS employment could become significant with a slight delay after the construction of the gas pipeline (Figure 54). It could extend the period of high employment initiated by the pipeline construction.

Figure 54. Estimated Total Employment on the North Slope with and without Chukchi OCS Development

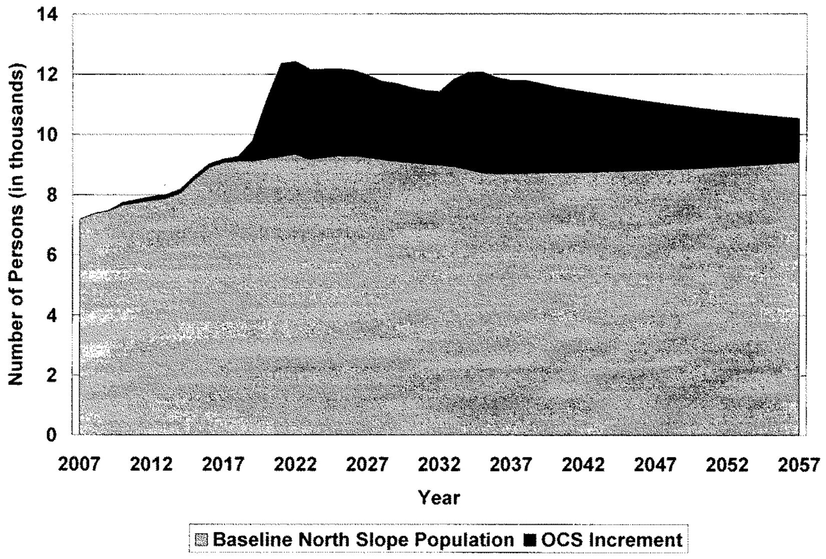


Source: ISER estimates.

The effect of the new employment opportunities provided by OCS development on the population of the region depends on the share of new jobs taken by residents, including new migrants into the region. Consistent with the historical trend, it is assumed that only a small share of the direct jobs are taken by local residents with the majority going to residents of urban Alaska and non-resident commuters from outside the state. However, all the government, infrastructure, and support jobs are taken by local residents.

The result is a projection of North Slope Borough population as shown in Figure 55. Population growth is rapid during the first years of OCS activity. After that total population is relatively stable with a slow downward trend as the impact of OCS moderates.

Figure 55. Estimated Local Population Effect, Chukchi OCS Development



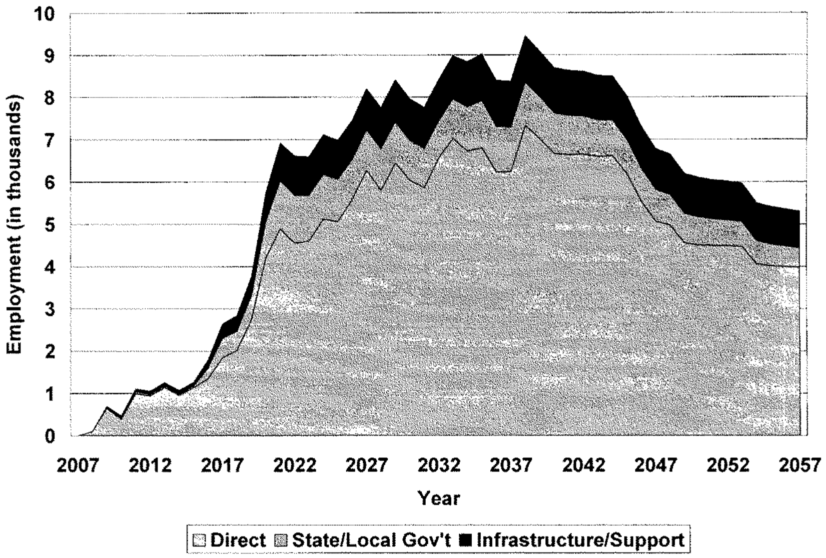
Source: ISER estimates.

4.4.3 Combined Beaufort and Chukchi OCS Development

Local employment associated with OCS development in the Beaufort and the Chukchi is projected to expand over a period of about 5 years, fluctuate moderately for the next 20 years, and then begin to decline, Figure 56 Shows the projected incremental employment on the North Slope resulting from the development of both the Beaufort and the Chukchi. Most of these jobs would be directly related to oil and gas exploration, development, and production.

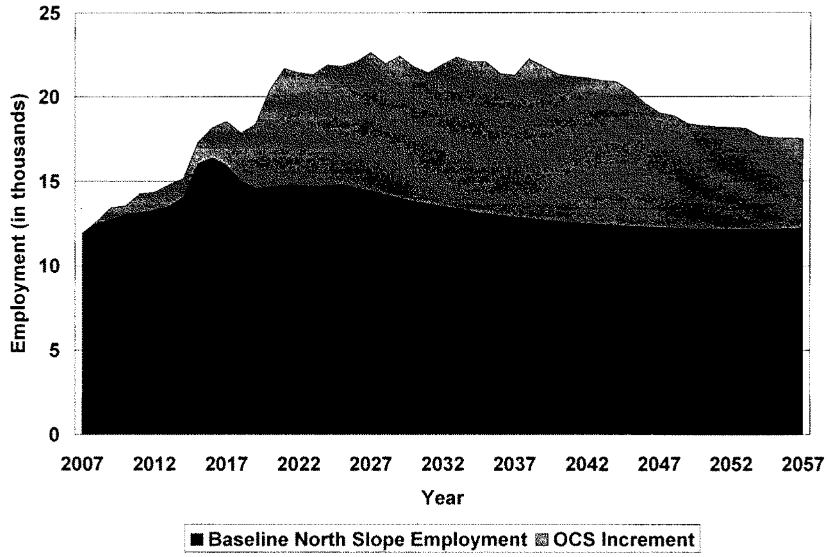
Figure 57 shows projected total employment in the North Slope with and without the combined OCS development in the Beaufort and the Chukchi. As noted earlier, OCS employment could become significant after the construction of the gas pipeline. It could extend the period of high employment initiated by the pipeline construction for a generation.

Figure 56. Estimated Incremental Employment on the North Slope with Beaufort and Chukchi OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Figure 57. Estimated Total Employment on the North Slope with and without Beaufort and Chukchi OCS Development

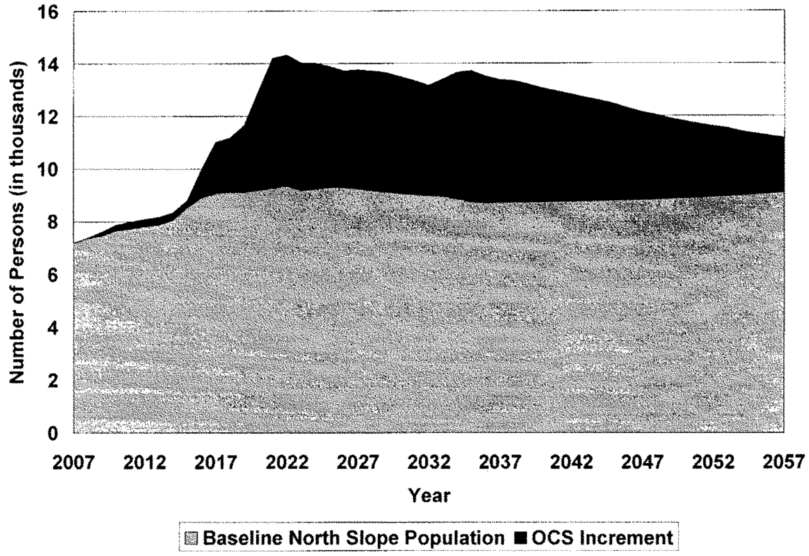


Source: ISER estimates.

The effect of the new employment opportunities provided by OCS development on the population of the region depends on the share of new jobs taken by residents, including new migrants into the region. Consistent with the historical trend, it is assumed that only a small share of the direct jobs are taken by local residents with the majority going to residents of urban Alaska and non-resident commuters from outside the state. However, all the government, infrastructure, and support jobs are taken by local residents.

The result is a projection of North Slope Borough population as shown in Figure 58. Population growth is rapid during the first years of OCS activity. After that, total population is relatively stable with a slow downward trend as the impact of OCS moderates.

Figure 58. Estimated Local Population Effect, Combined Beaufort and Chukchi OCS Development



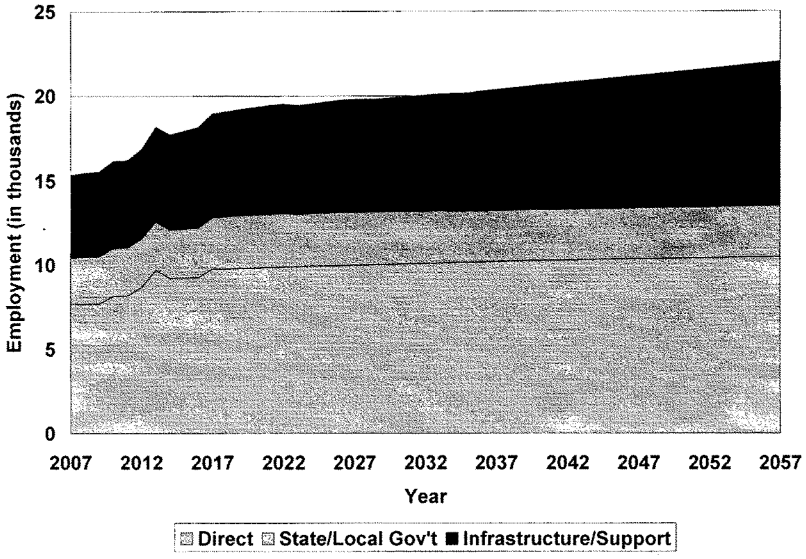
Source: ISER estimates.

4.4.4 North Aleutian OCS

In the absence of OCS development, employment in the North Aleutian region (defined here as the Aleutians East, Bristol Bay, and Lake and Peninsula Boroughs as well as the Aleutians West and Dillingham Census Areas) is projected to grow rapidly in the coming years due to the development of the proposed Pebble Mine in the Lake and Peninsula Borough (Figure 59). This will increase the number of direct jobs, currently dominated by seafood harvesting and processing. Infrastructure and support jobs become a larger share of the total over time.

This pattern represents only one possible future scenario for the North Aleutian region. In particular this pattern of government and support employment assumes that the resident population will remain at least at the current level. However, in recent years out migration from rural Alaska has increased. A continuation of that trend could result in both a smaller population and a smaller number of jobs than projected in this study.

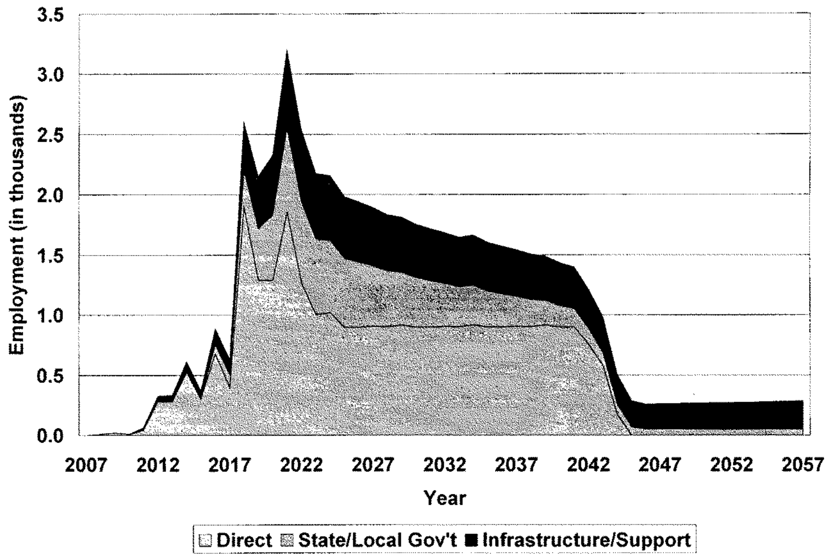
Figure 59. Estimated Employment in the North Aleutian Region without OCS Development



Source: Northern Economics, Inc. and ISER estimates.

The local employment associated with OCS development could expand rapidly, stabilize for a period of 20 years, and then rapidly fall off (Figure 60). Most of the jobs would be directly related to oil and gas exploration, development, and production.

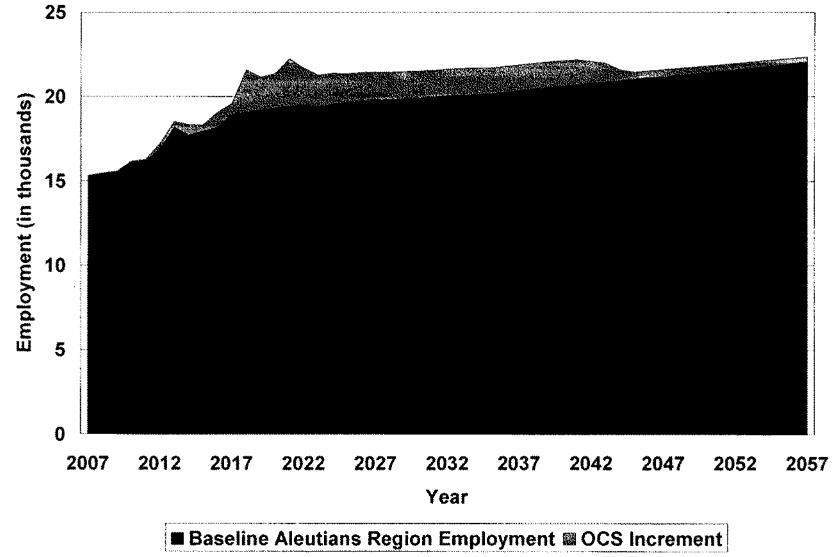
Figure 60. Estimated Incremental Employment in the North Aleutian Region with North Aleutian Basin OCS Development



Source: Northern Economics, Inc. and ISER estimates.

The OCS employment could become significant to the region after the development of the Pebble Mine (Figure 61).

Figure 61. Estimated Total Employment in the North Aleutian Region with and without North Aleutian OCS Development

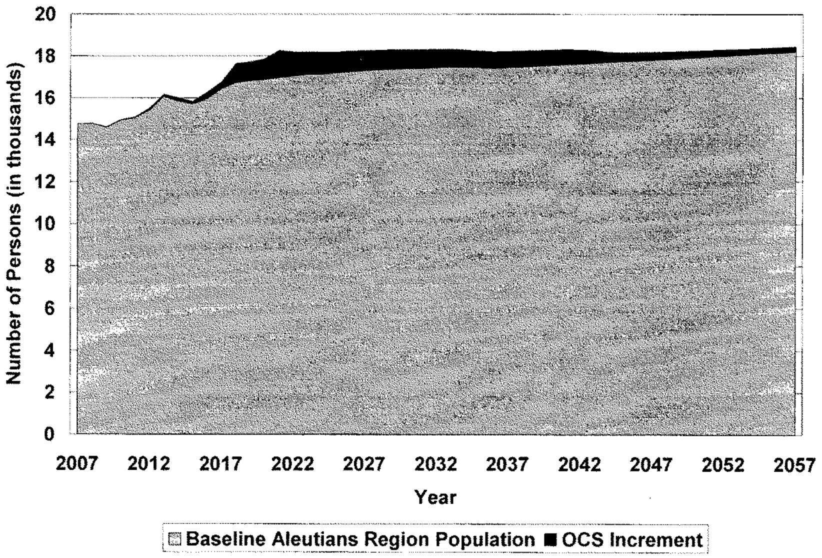


Source: ISER estimates.

The effect of the new employment opportunities provided by OCS development on the population of the region depends on the share of new jobs taken by residents, including new migrants into the region. Consistent with the historical trend, it is assumed that only a small share of the direct jobs are taken by local residents with the majority going to residents of urban Alaska and non-resident commuters from outside the state. However, all the government, infrastructure, and support jobs are taken by local residents.

The result is a projection of North Aleutian regional population as shown in Figure 62. Population growth is rapid during the first years of OCS activity. After that, total population is relatively stable.

Figure 62. Estimated Local Population Effect, North Aleutian Basin OCS Development



Source: ISER estimates.

4.5 Potential Revenue Effects

The analysis of potential revenue effects of future OCS development is focused on projected revenues to the state and local governments. Total state and local government take from direct and indirect petroleum revenues, as well as population-related revenues were projected.

This section is organized into the following sub-sections: 1) *Revenue Parameters*—this section discusses the various sources of government revenues and the assumptions used in projecting the potential revenue effects from each source; and 2) *Projected Direct Petroleum Revenues*—this section discusses the estimated direct petroleum revenues that could accrue to the State of Alaska and each of the directly impacted local governments from shared lease payments (if any), property taxes, and state corporate income taxes.

The next subsection, 4.6 *Potential Fiscal Effects*, addresses the fiscal effects to the State and local governments. Section 4.6.1 combines direct and indirect revenues projected to accrue to the State of Alaska and compares these to the projected expenditures that could be required to support the increase in statewide population resulting from OCS development, including incremental state expenditures to manage OCS-related programs. The fiscal effects on directly impacted local governments are discussed separately from the state fiscal effects, in Section 4.6.2.

4.5.1 Revenue Parameters

The parameters that are defined and described in this section include: 1) direct petroleum revenue sources; 2) population-related revenue sources; and 3) indirect revenue sources.

4.5.1.1 Direct Petroleum Revenue Parameters

There are 3 major sources of direct petroleum revenues associated with OCS oil and gas activities: 1) *lease revenues*, 2) *property taxes* associated with new onshore infrastructure, and 3) *state corporate income taxes*. The definitions and modeling assumptions are discussed below.

Lease Revenues

OCS lease revenues are comprised of three payment streams: 1) bonus bids, 2) rental payments, and 3) royalty payments.

Bonus bids

Bonus bids are cash payments paid to the federal government in exchange for the right to explore and develop the petroleum reserves in OCS areas. Companies/explorers participate in a sealed bid auction to lease tracts of land during scheduled area-wide lease sales.

Bonus bids are generated at the time the area-wide lease sales occur. The model estimates bonus bids based on historical patterns. Typically, succeeding lease sales generate fewer bids because the good prospects have been previously picked over. In the Chukchi therefore, it is expected that the next lease sale will generate significantly less bonus bids than the 2008 lease sale. In the North Aleutian basin however, interest in the area is expected to be high because of higher petroleum prices and more recent attractiveness of gas resources compared to the last lease sale held in the area, where oil was the primary target. In 1988, industry high bids in the North Aleutian Basin totaled $95 million on 23 tracts (these covered the biggest prospects).

Future revenues from bonus bids are expected as follows: 1) in the Beaufort, bonus bids are scheduled to be received in 2009 and 2011; 2) in the North Aleutian, bonus bids are expected to be generated in 2011; and 3) in the Chukchi, bonus bids will be generated in 2010 and 2012. The results of the recent Chukchi lease sales that generated $2.66 billion in bonus bids have been incorporated into the model.

Rental payments

A rental payment is established in the lease agreement and made to the lessor (MMS) every year; there is no royalty payment from production. The MMS does not place a lease back on annual rental status once production has begun, even though production has stopped and the lease is still in its primary term. In such cases, the lessee pays minimum royalty, which for MMS is calculated at the same rate as the rental. Rental rates vary per year and are usually specified in the Final Notice of Sale. In the most recent Chukchi lease sale for example, the rental rates established are as described in Table 25.

Table 25. Schedule of Rental Payments

Year of Lease	$ per Hectare	$ per Acre
1	2.50	1.01
2	3.75	1.52
3	5.00	2.02
4	6.25	2.53
5	7.50	3.04
6	10.00	4.05
7	12.00	4.86
8	15.00	6.07
9	17.00	6.88
10	20.00	8.09

Source: MMS, 2008.

During the time period in which a lease is classified as producible (following a discovery of commercial quantities, but before royalty bearing production) a rental of $13 per hectare (or $5.42 per acre), or fraction thereof applies and is paid at the end of each lease year until the start of royalty bearing production. The model assumes a flat rental rate of $7.50 per acre.

Royalty payments

A royalty is a share of the minerals produced from a lease. It is a percentage of production paid either in money or in kind that a federal lease is required to pay. On the Alaska OCS, typically a 12.5 percent royalty rate is applied for OCS leases that are in production. A minimum royalty payment is typically established as part of the lease agreement. The lessee pays MMS a minimum royalty at the expiration of each lease year with a credit applied for actual royalty paid during the lease year.

Under certain circumstances, a royalty relief or suspension is granted by the Secretary of Interior to promote increased oil and gas production. The royalty suspension is prorated by lease acreage and is subject to price thresholds. This analysis assumes, given the projected oil and gas prices, that no royalty suspension would apply to any of the Alaska OCS leases.

For the purpose of this analysis, royalties were estimated based on projected oil prices fluctuating around $65 per barrel in constant dollars and natural gas (Henry Hub) prices fluctuating around $6.40 per mmBtu for the period between 2008 and 2030, and then increasing at one-half of one percent per year through 2057. The price assumptions through 2030 are based on publicly available long-term price projections for oil and natural gas generated by the Energy Information Administration (Annual Energy Outlook 2008). The Annual Energy Outlook presents a projection and analysis of U.S. energy supply, demand, and prices through 2030. The projections are based on results from the Energy Information Administration's National Energy Modeling System. The implications of higher prices on the potential revenue effects are discussed in Section 5.

To calculate the royalties, netback prices for oil and gas were used. The netback price reflects the price of the resource at the point of production (market price less transportation costs).

Current OCS Lease Revenue Sharing Arrangement

Revenues from offshore federal leases are statutorily allocated among the coast states, the Land and Water Conservation Fund, the National Historic Preservation Fund, and the U.S. Treasury. Revenues received by the coastal states are also shared with the coastal political subdivisions (local governments) that are or will be affected by offshore oil and gas development.

The revenue estimates presented in this section reflect the revenue sharing arrangement that currently exists. It is anticipated that various stakeholders, particularly the state government, would initiate efforts to gain the same kind of revenue sharing arrangement as the arrangement in place in the Gulf of Mexico. The existing OCS revenue sharing arrangement is as follows:

The State of Alaska receives 27 percent of OCS lease revenues from leases that are in 8(g) zone. The 8(g) revenue stream is the result of a 1978 Outer Continental Shelf Lands Act (OCSLA) amendment that provides for a "fair and equitable" sharing of revenues from 8(g) common pool lands. These lands are defined in the amendments as submerged acreage lying outside the 3-nautical mile state-federal demarcation line, typically extending to a total of 6 nautical miles offshore. The states' share of the revenue (27 percent) was established by the OCSLA amendments of 1985 (P.L. 99-272) and is paid directly to the states.

In this study, 8(g) revenues are projected to be generated only from leases in the Beaufort. This analysis assumes that 0.2 percent of the lease acreage in the Beaufort Basin fall within the 8(g) zone; and the rest of the lease acreage lie further out in federal offshore areas. This assumption is based on information on existing 8(g) tracts in the Beaufort. No leases are assumed to be in the 8(g) zone in the Chukchi and North Aleutian OCS.

In addition to the 8(g) revenue stream, Alaska also currently receives funds from the Coastal Impact Assessment Program (CIAP). CIAP was established under the Energy Policy Act of 2005 (P.L. 109-58). Under this program, the Secretary of the Interior distributes $250 million per year during FY2007 to FY 2010 to producing states and political subdivisions according to specified allocations. Alaska is one of six oil and gas producing states that are eligible to receive CIAP funds[14]. Alaska received $2.425 million in the FY2007 and FY2008 allocations (this represents only one percent of the total amount shared among the six states). However, due to the highly successful Chukchi lease sale held in early February 2008 that generated $2.7 billion in federal OCS revenues, the MMS estimates that Alaska's CIAP allocation[15] would increase to somewhere between $29 million and $41.2 million for FY2009 and FY2010 (Alaska Department of Natural Resources Division of Coastal and Ocean Management, 2008).

A portion of the State's share of CIAP funds are shared with local governments (or coastal political subdivisions [CPS]) according to a 3-part formula as follows:

- 25 percent is allocated to the CPSs based on the proportion of population that the CPS bears to the total population of all the CPSs in the state.
- 25 percent is allocated to the CPSs based on the ratio of the coastline length of the CPS to the total coastline length of all the CPSs in the state.

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[14] Besides Alaska, other states receiving CIAP funds include: California, Alabama, Louisiana, Mississippi, and Texas.

[15] The amounts disbursed to each producing state in each of the fiscal years 2007 thru 2010 are based on the ratio of the amount of qualified OCS revenues generated off the coastline of the producing state bears to the amount of qualified OCS revenues generated off the coastline of all producing states (Coastal Impact Assessment Program, Technical Documentation of the Methodology for the Allocation Formulas; OCS Report MMS 2007-065).

- 50 percent is allocated to the CPSs in amounts that are inversely proportional to the respective distance between the geographic center of each leased tract and the closest point on the perimeter of each CPS to the geographic center of each leased tract.

For FY 2007 and FY 2008, the allocations to the different CPSs in Alaska were determined as shown in Table 26.

Table 26. Coastal Impact Assessment Program (CIAP) Fund Alaska Allocations for FY2007 and FY2008

Year	Alaska	Coastal Political Subdivisions
FY 2007	$1,576,250	$848,750
FY 2008	$1,576,250	$848,750
Alaska Coastal Political Subdivisions (CPSs)	**Allocation (%)**	**Total Allocation ($)**
Anchorage	16.23	137,752
Bristol Bay Borough	0.08	679
Kenai Peninsula	7.00	59,413
Kodiak Island	8.62	73,162
Lake and Peninsula	4.07	34,544
Matanuska-Susitna Borough	3.70	31,404
North Slope Borough	32.57	276,438
Northwest Arctic Borough	27.73	235,358
Total	**100.00**	**848,750**

Source: MMS, 2008

To receive CIAP funds, the producing states are asked to submit plans for approval by the Secretary of Interior regarding the use of funds. These funds are designated for the restoration of coastal areas, mitigation of damage to natural resources, implementation of federally approved conservation management plans, and for infrastructure projects.

CIAP Funds are only available thru FY2010. Unless another law is passed to continue or replace CIAP, the Alaska take of future OCS lease revenues would be limited to the 27 percent of 8(g) lease revenues. As noted earlier, this analysis assumes 8(g) leases (0.2 percent of total leased acreage) only in the Beaufort; and none in the Chukchi and North Aleutian OCS areas.

Property Taxes

Property taxes are another source of revenue from OCS oil and gas development. New onshore facilities built to support oil and gas development will be subject to property taxes. A local tax is levied on the state's assessed value[16] for oil and gas property within a city or borough, and is subject to the local property tax limitations established in AS 29.45.080 and AS 29.45.100. The state's mill rate is effectively 20 mills minus the local rate, which in the case of the North Slope Borough, is 18.5 mills.

For this study, the Beaufort OCS development scenario assumes that approximately 35 miles of onshore pipelines, one for oil and one for gas, will be built to connect to TAPS and the proposed Alaska natural gas pipeline. In addition, a marine terminal, production facility, and support base are assumed to be built onshore to support the offshore activities. These onshore facilities are estimated to be valued at $2.66 billion.

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[16] Oil and gas property values are assessed by the State of Alaska.

Similarly, the development scenario for the Chukchi assumes building the following onshore facilities: 1) a marine terminal; 2) a support base; 3) a production facility; and 4) approximately 500 miles of onshore oil and gas pipelines (each could be a 250-mile pipeline). These new onshore facilities are estimated to be worth $6.1 billion.

For the purpose of this analysis, it is assumed that the marine terminal/support base could be located anywhere on the coast between Wainwright and Point Hope. Similarly, the oil and gas pipelines are assumed to traverse through the NPR-A from west to east connecting to TAPS and the proposed Alaska North Slope (ANS) gasline in the Prudhoe Bay area; however, it is also possible that the oil and gas pipelines could be oriented differently and connect to TAPS and the ANS gasline somewhere further south of the Prudhoe Bay unit.

For the North Aleutian scenario, new onshore infrastructure could include: 1) a shorebase to support exploration and production activities; 2) onshore pipelines for oil and gas; 3) an LNG facility and terminal; 4) another marine terminal for oil; and 5) an onshore production facility. These onshore facilities are estimated to be valued at $3.87 billion. The analysis assumes that the Aleutians East Borough would levy local property taxes similar to the tax rate in the North Slope Borough; otherwise the state gets the full 20 mills.

State Corporate Income Taxes

The state also obtains revenue from the special state corporate income tax on petroleum activity. The tax is calculated as 9.4 percent of the Alaska share of worldwide income for each corporation. The Alaska income is calculated using a "modified apportionment formula," which averages the Alaska share of corporate worldwide property, sales, and extraction and applies that formula to calculate the Alaska share of worldwide income. The state apportions the tax base for all other types of corporations using a formula that substitutes payroll for extraction. Consequently, the Alaska tax base for the special corporate income tax on petroleum depends not only on activity and profits within Alaska, but also on activity and profits in other locations, making it difficult to forecast. This is reflected in the historical variability of tax revenues which have averaged 2.6 percent of the value of production at the wellhead, but ranged from a low of 0.3 percent to a high of 5.1 percent. Annual revenues have ranged from $18 million to $860 million, or from $.03 to $2.32 per barrel of oil.

For this analysis, the estimate of direct corporate income tax revenues to the state from OCS activity is based on the wellhead value of OCS production and a modified apportionment formula that reflects the special OCS conditions. First, it excludes the sales and extraction components of the formula, on the assumption that all OCS sales and extraction would occur outside the jurisdiction of Alaska (in federal waters). Second, it includes only that share of the property associated with OCS activities which is onshore. Finally, it assumes that the OCS operation of the companies would have "stand alone" status—that is, the characteristics of their other operations, either onshore Alaska or elsewhere in the world, would not impact their Alaska OCS tax liability.

The result is a very small allocation of OCS income to the state petroleum income tax base. The historical 2.6 percent ratio of revenues to the value of production is adjusted downward to 0.13 percent to estimate future corporate petroleum revenues to the state from OCS production. Although the onshore share of petroleum property is likely to differ among the OCS basins, the analysis uses 0.13 percent for each basin because of the inherent uncertainty surrounding this estimator.

4.5.1.2 Population-Related Revenue Parameters

State sales and use tax revenues (motor fuels, insurance, premiums, tobacco products, etc.), corporate income tax revenues (excluding petroleum), and motor vehicle license fees all will increase due to the economic activity and population engendered from OCS development.

The state does not currently have either a general sales tax or a personal income tax. However, the non OCS projection of future state population and public sector demands compared to revenues suggests that a number of adjustments to the state fiscal structure will be necessary in future years to maintain adequate public services. Although it is impossible to anticipate the exact nature of these adjustments, or when they may be put into place, the two options available to the state are, in addition to reducing expenditures, institution of a broad-based tax and use of a portion of the earnings of the Permanent Fund. (Additional taxes on other resource industries could generate only very modest revenues.) It is anticipated that both will be required in the non OCS case, in spite of commercialization of North Slope gas. Use of permanent fund earnings to fund state programs begins in 2023. A personal income tax, similar to the tax that was eliminated in 1980, will be phased in between 2022 and 2026. This personal income tax will be the largest source of population-related revenues from OCS development because the tax base will be the entire payroll generated by the OCS development. It is assumed that the alternative of a statewide sales tax would generate an equivalent amount of revenue.

It is possible that neither a personal income tax nor a statewide sales tax would be necessary or instituted in the future. If that were the case, it would represent a conscious decision of the state not to take advantage of its largest untapped tax base, and rather to finance state government expenditures by other means. However, the estimated revenues from the personal income tax in response to OCS development do represent one element of the capacity of the development to pay for public services, and for this reason, it would be incorrect not to include it as a revenue source.

4.5.1.3 Indirect Petroleum Revenue Parameters

OCS development is expected to generate additional state petroleum-related revenues (or indirect revenues) from spillover effects on other oil and gas activities on the North Slope. Although there is considerable uncertainty about how large these additional revenues might be, it is important to identify the sources of these revenues and to develop a conservative idea of their potential magnitude. This study identifies four sources of indirect revenues that arise from the lower cost of petroleum production and transportation generated by OCS development:

- TAPS—Fuller Pipeline Enhanced Value of North Slope Production
- TAPS—Fuller Pipeline Additional North Slope Production
- Gas Pipeline Tariff Reduction Effect
- Incremental Production due to OCS Infrastructure

TAPS: Fuller Pipeline Enhanced Value of North Slope Production

OCS oil from the Beaufort Sea and the Chukchi Sea may be transported to market through the existing TAPS oil pipeline from the North Slope to Valdez. If OCS oil is transported through TAPS, the higher volume of throughput would reduce the TAPS tariff and extend the life of TAPS.

The TAPS pipeline is currently operating at about one-third of its capacity of 2 million barrels per day, and will be carrying less oil in the future as North Slope production continues to decline. The pipeline tariff, based on the cost of its operation, is sensitive to the volume of oil and tends to increase as the volume falls. If OCS oil were added to the TAPS pipeline it would increase the throughput, and this would reduce the tariff on all the oil flowing through the line. Because the price of oil at the wellhead is a "netback" price based on the market price net of transportation costs, a lower pipeline tariff would increase the wellhead value of North Slope oil. Since the royalty on oil from state lands and the production tax are based on the wellhead value of the oil, a lower tariff would increase the revenues to the state from the royalties and the production tax (the analysis does not incorporate the possible effect on the corporate income tax).

The lower tariff translates into in an increase in wellhead value of a barrel of oil on the North Slope. The study assumes that all non-OCS production is from state lands and the combined revenue yield as a share of the increase in the value of production is 40 percent. The yield is high because the increase in the value of production would all be profit.

Furthermore, in the absence of OCS oil throughput, TAPS is anticipated to shut down when it reaches the minimum technically viable level of daily throughput—estimated at 200,000 barrels per day—which could be reached in 2046. Because this shut down would leave oil worth billions stranded on the North Slope, some alternative to move the oil to market would be deployed. It is assumed that a marine transport system could be used to move the remaining oil to market at an estimated cost of $15 per barrel ($2007).To the extent that OCS volumes extend the date when TAPS shuts down, the state and onshore producers would benefit from the lower TAPS tariff as compared to marine transport, with resulting higher wellhead value, and higher revenues to the state from royalties and the production tax.

TAPS-Fuller Pipeline Additional North Slope Production

A higher wellhead value resulting from the higher TAPS pipeline throughput because of OCS oil is also anticipated to have a stimulating effect on exploration and development of North Slope reserves. The average increase in wellhead value due to higher TAPS throughput is estimated to be six percent. The effect could be similar to an increase in industry activity due to higher oil prices or a reduction in taxes. Based on studies of the sensitivity of North Slope production to the price of oil, as well as observations that higher prices stimulate the development of satellite fields (smaller accumulations of oil that are adjacent to larger fields), it is estimated that this stimulating effect could result in an increase in oil production equal to 141 million barrels over the projection period. This could translate to an increase in state revenues of about $2 billion.

Gas Pipeline Tariff Reduction Effect

Similar to the full TAPS tariff reduction effect, development of natural gas from OCS leases in the Beaufort and Chukchi Sea would result in higher gas pipeline throughput starting in 2029, when gas from the Beaufort OCS is assumed to come on line. The increase in the gas pipeline throughput is expected to reduce the tariff only up to a certain point where the capacity of the pipeline could be expanded through additional compression. Beyond this point, the tariff would go up due to the expensive looping system that would have to be constructed to further expand the pipeline to accommodate gas volumes higher than 6.5 billion cubic feet per day. The tariff structure of the gas pipeline has not been determined at this point. However, for the purpose of this study, the potential full gas pipeline tariff reduction effect that could result with OCS gas development is estimated using the rolled-in rate pipeline expansion analysis proposed by TransCanada as provided in their Alaska Gasline Inducement Act (AGIA) application (AGIA website, State of Alaska). The TransCanada analysis showed the estimated rolled-in rate tariff in dollars per million Btu's given different step increases in throughput levels from 4.5 to 7.2 BCF per day. For this analysis, it is assumed that the pipeline throughput is expanded by 600 million cubic feet per day in 2029 (from 4.5 to 5.1 BCF per day) due to the Beaufort OCS gas; resulting in a \$.07 per MCF reduction in tariff. An additional expansion is further assumed as a result of the Chukchi OCS gas; the expansion could increase the gas pipeline's daily throughput to 5.9 BCF per day sometime after 2040. The reduction in tariff given this volume of expansion is estimated to be \$0.16 per million cubic feet. Since expansion volumes could come from other onshore sources as well, OCS gas is assumed in this analysis to contribute only 1 BCF per day of the total additional throughput beyond the 4.5 BCF per day base case.

This reduction in tariff is projected to generate additional royalties and production tax payments to the State of Alaska because these payments are calculated based on the wellhead value of the resource (market price less transportation cost). The estimated cumulative state benefits resulting from the full gas pipeline tariff reduction effect is about \$1.2 billion.

Incremental Production due to OCS Infrastructure

OCS development will increase the amount and geographic reach of petroleum infrastructure on the North Slope. The presence of additional petroleum infrastructure and its geographic distribution suggests that there could be opportunities for the development of otherwise marginal fields if they are in close geographic proximity to OCS infrastructure or that could share OCS facilities. An expanded support industry due to OCS developments could also be the source of cost savings that could make some marginal fields economically attractive. The potential production and revenues from these latter effects could be very large, but very difficult to quantify. However, to demonstrate the potential magnitude of these effects on state revenues, it is assumed that cumulative North Slope production is increased by two percent—87 million barrels—as a result of these effects. This could generate \$1.2 billion (2007\$) in additional state revenues from production and corporate income taxes and royalty payments to the state.

4.5.2 Potential Direct Petroleum Revenues

This section presents the estimated revenues that could accrue to the state and local governments (Boroughs) from future oil and gas development in the three Alaska OCS areas. Under the Beaufort OCS development scenario, lease revenues from 8(g) common pool lands and revenues from property and corporate income taxes will accrue to the state and to the North Slope Borough. Under the Chukchi and the North Aleutian OCS development scenario, there will be no shared lease payments accruing to the state and local governments.

The potential cumulative direct petroleum revenues to Alaska from all three OCS areas could be \$5.8 billion (2007\$) with most revenues going to directly impacted local communities from property taxes on onshore petroleum facilities. Table 27 summarizes the potential cumulative revenues that could accrue to the different government entities from 2008 to 2057.

Table 27. Potential Cumulative Direct Petroleum Revenues Accruing to the State of Alaska and Local Governments, 2008 to 2057(in Billions of 2007$)

Entity/Source of Revenue	Amount
State of Alaska	**1.4**
Property Tax	0.4
Corporate Income Tax	1.0
Shared Lease Payments	--
Directly Impacted Local Governments	**4.5**
Property Tax	4.5
Shared Lease Payments	--
Other Local Governments	
Shared Lease Payments	--
Total Alaska	**5.8**

Source: Northern Economics, Inc. and ISER estimates.

Notes:

1) The sum of the amounts may not equal total due to rounding.
2) Other local governments refer to coastal political subdivisions, other than the directly impacted governments (assumed to be the North Slope Borough and Aleutians East Borough), that are by statute eligible to receive Coastal Impact Assistance Program funds.

Potential direct revenue effects resulting from each OCS development are discussed in separate sub-sections below.

4.5.2.1 Potential Revenues from Beaufort OCS Development

The potential cumulative direct petroleum revenues resulting from the Beaufort OCS development are presented in Table 28.

The State of Alaska is projected to receive about $400 million in cumulative property tax revenues, corporate income tax revenues, and shared lease payments (primarily from 8(g) leases). As noted earlier, for this study, the Beaufort OCS is the only area assumed to have leases in 8(g) zone.

Given the assumed onshore infrastructure expected to be developed to support oil and gas development in the Beaufort OCS, the North Slope Borough could receive $1.1 billion in local property taxes, cumulative over the years 2008 to 2057.

Table 28. Potential Cumulative Direct Petroleum Revenues, Beaufort OCS Development, 2008 to 2057 (in Billions of 2007$)

Government Entity/Revenue Source	Amount
State Revenues	**0.4**
Property Tax	0.1
Corporate Income Tax	0.3
Shared Lease Payments	
General Fund	--
Permanent Fund	--
North Slope Borough	**1.1**
Property Tax	1.0
Shared Lease Payments	--
Total Government Take	**1.5**

Source: Northern Economics, Inc. and ISER estimates.
Note: The sum of the amounts may not equal total due to rounding.

4.5.2.2 Potential Revenues from Chukchi OCS Development

Alaska is not anticipated to receive any share of the lease revenues from the Chukchi leases. Nonetheless, total cumulative direct petroleum revenues accruing to the State and the North Slope Borough are projected to amount to over $3 billion (See Table 29).

Table 29. Potential Cumulative Direct Petroleum Revenues, Chukchi OCS Development, 2008 to 2057 (in Billions of 2007$)

Government Entity/Revenue Source	Amount
State Revenues	**0.8**
Property Tax	0.2
Corporate Income Tax	0.6
Shared Lease Payments	--
North Slope Borough	**2.4**
Property Tax	2.4
Shared Lease Payments	--
Total Government Take	**3.1**

Source: Northern Economics, Inc. and ISER estimates.
Note: The sum of the amounts may not equal total due to rounding.

4.5.2.3 Combined Potential Revenues from Beaufort and Chukchi OCS Development

The combined revenue effects of the Beaufort and the Chukchi OCS development indicate the magnitude of benefits that could be generated in the North Slope region. The North Slope Borough is projected to generate total cumulative property tax revenues of about $3.5 billion from taxable onshore facilities that are assumed to be required to support the development of oil and gas resources in the Beaufort and the Chukchi OCS. Total cumulative government take resulting from the combined Beaufort and Chukchi OCS development is estimated to be $4.6 billion (see Table 30).

Table 30. Potential Cumulative Direct Petroleum Revenues, Combined Beaufort and Chukchi OCS Development, 2008 to 2057 (in Billions of 2007$)

Government Entity/Revenue Source	Amount
State Revenues	**1.2**
Property Tax	0.3
Corporate Income Tax	0.9
Shared Lease Payments	
General Fund	--
Permanent Fund	--
North Slope Borough	**3.5**
Property Tax	3.5
Shared Lease Payments	--
Total AK Government Take	**4.6**

Source: Northern Economics, Inc. and ISER estimates.

Note: The sum of the amounts may not equal total due to rounding.

4.5.2.4 Potential Revenues from North Aleutian Basin OCS Development

The potential cumulative direct petroleum revenues resulting from the North Aleutian Basin OCS development are presented in Table 31.

The State of Alaska is projected to receive about $200 million in cumulative property tax revenues, and corporate income tax revenues.

Given the assumed onshore infrastructure expected to be developed to support oil and gas development in the North Aleutian OCS, the regional government could receive $1 billion in local property taxes, cumulative through 2057.

Table 31. Potential Cumulative Direct Petroleum Revenues, North Aleutian OCS Development, 2008 to 2057 (in Billions of 2007$)

Government Entity/Revenue Source	Amount
State Revenues	**0.2**
Property Tax	0.1
Corporate Income Tax	0.1
Shared Lease Payments	--
General Fund	--
Permanent Fund	--
Directly Impacted Communities	**1.0**
Property Tax	1.0
Shared Lease Payments	--
Total Government Take	**1.2**

Source: Northern Economics, Inc. and ISER estimates.

Note: The sum of the amounts may not equal total due to rounding.

4.5.2.5 Potential Revenues for All OCS Activity

Total Alaska government take from all OCS activity is projected to amount to $5.8 billion through 2057 (see Table 32).

Table 32. Potential Cumulative Direct Petroleum Revenues, All Three OCS Areas, 2008 to 2057 (in Billions of 2007$)

Government Entity/Revenue Source	Amount
State Revenues	**1.4**
Property Tax	0.4
Corporate Income Tax	1.0
Shared Lease Payments	
General Fund	--
Permanent Fund	--
North Slope Borough	**3.5**
Property Tax	3.5
Shared Lease Payments	--
Aleutians East Borough	**1.0**
Property Tax	1.0
Shared Lease Payments	--
Total Government Take:	**5.8**

Source: Northern Economics, Inc. and ISER estimates.

Note: The sum of the amounts may not equal total due to rounding.

4.5.3 Population-Related and Indirect Revenue Effects of OCS Development

Table 33 summarizes the potential cumulative population-related revenue effects and the indirect revenue effects of OCS development. The effects for each OCS area are discussed in the next section as part of the fiscal effects discussion.

Table 33. Potential Cumulative Population-Related and Indirect Revenue Effects of OCS Development, 2008 to 2057 (in Billions of 2007$)

Source/Category	Amount
Population Related Revenues	3.9
Indirect Petroleum Revenues	
TAPS- Full Pipeline Enhanced Value of North Slope Production	5.7
TAPS- Full Pipeline Additional North Slope Production	2.0
Gas Pipeline Tariff Reduction Effect	1.2
Incremental Production due to OCS Infrastructure	1.2
Total	**14.0**

Source: Northern Economics, Inc. and ISER estimates.

Note: The sum of the amounts may not equal total due to rounding.

4.6 Potential Fiscal Effects

This section discusses the potential fiscal effects at the state level and at the local/regional level.

4.6.1 Potential State Fiscal Effects

OCS development will generate state revenues in three ways. A share of state revenues will come directly from property and corporate income taxes on OCS activity as well as from the sharing of lease revenues with the federal government. The state will also receive revenues from the taxes and fees paid by the households of those working directly on OCS-related jobs as well as those working in other businesses providing goods and services to the petroleum industry and to Alaska households. Finally, because the development of the OCS will reduce the cost of business for the petroleum industry in the state and facilitate the development of additional oil and gas through the addition of new petroleum related infrastructure, state revenues from non-OCS petroleum activity will increase.

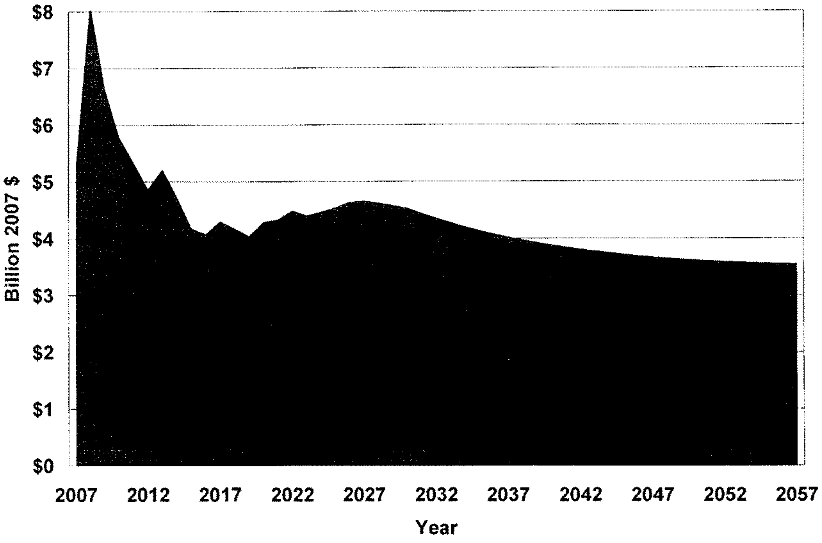
At the same time OCS development will place new demands on state government. These demands will come primarily from the population growth accompanying OCS development.

These state fiscal effects must be interpreted within the context of the overall fiscal future of the state. In the absence of OCS development, the population of the state is projected to increase, putting additional demands on the state budget. But at the same time petroleum revenues, the major source of funding for the budget, are projected to fall. New sources of revenues and spending restraint will be required to maintain state fiscal integrity. Within that context, OCS activity is projected to generate a positive state fiscal balance with revenue growth exceeding the spending necessary to meet the demands of the OCS induced population growth.

4.6.1.1 General Fund

The state government provides a larger share of state and local public services in Alaska compared to most other states because of the limited fiscal capacity of Alaska local governments, and the general fund is the mechanism for funding most state programs. In the absence of OCS development, and given the MAP model assumptions as discussed in Section 2.2, state general fund revenues are projected to exceed state expenditures until 2015, after which time annual revenues fall below annual expenditures. Starting in 2015, the state begins to draw down accumulated balances in the general fund and constitutional budget reserve. Revenues from the development of a gas pipeline starting in 2020, the phasing in of a state personal income tax starting in 2022, reduction in the Permanent Fund dividend by half, and diversion of remainder of the earnings of the Permanent Fund to support general fund expenditures starting in 2023 largely offset declining oil revenues for a decade but eventually they are insufficient to forestall a downward trend in general fund revenues (Figure 63 shows general fund revenues). As a consequence, real per capita general fund spending trends slowly downward toward its historical level in the late 1990s.

Figure 63. State General Fund Revenue, No OCS Case



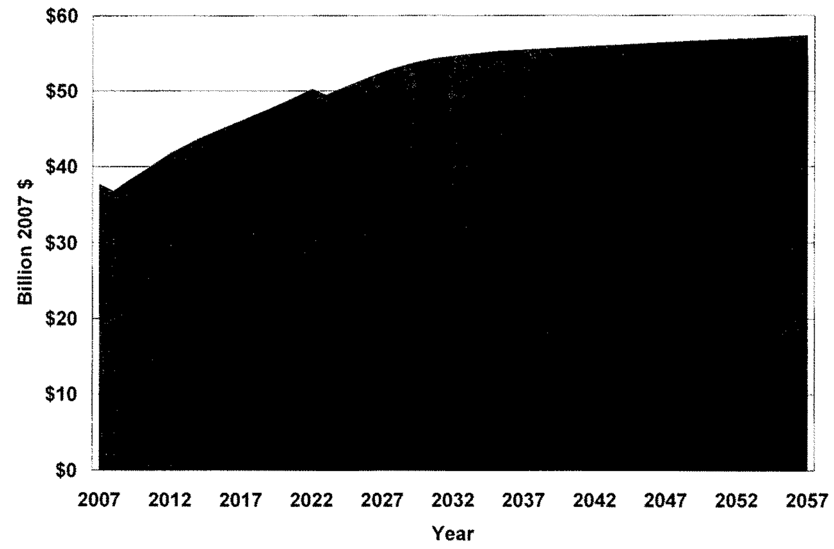
Source: Northern Economics, Inc. and ISER estimates.

OCS development results in additional general fund revenues from the state property tax, the corporate income tax, and sharing of federal lease revenues including the 8(g) revenues. Additional general fund revenues are also generated by new workers and their families from various fees, excise taxes, and the personal income tax. General fund spending also increases to pay for the public services required by the new petroleum activity and population.

4.6.1.2 Permanent Fund

The Permanent Fund balance grows over time from deposits from a portion of the state royalties from oil and gas production as well as annual appropriations for inflation proofing (see Figure 64).

Figure 64. Permanent Fund Balance No OCS Case



Source: Northern Economics, Inc. and ISER estimates.

With OCS development, the Permanent Fund would, under current law, receive a share of any lease payments shared with the federal government. In the absence of a change in the sharing arrangements, the amount is projected to be trivial—25 percent of 8(g) revenues.

4.6.1.3 State Expenditures

The growth in population associated with OCS development will increase the demand for state government services, particularly education (including the University), public safety, transportation, corrections, and public health. Although a precise estimate of these incremental public sector requirements is impossible to develop, it is important to indicate the likely demand that this additional population could place on public financial resources. Following a 1995 study by ISER entitled *Marginal Oil Field Development: The Economic Impact*, the incremental population was divided into four groups—infants, school-aged children, adults, and senior citizens (over time some adults drawn to the state for work could retire and remain in Alaska). The "per client" public service demand for each group was calculated based on the 2007 state budget.

The per capita state operating budget in 2007 was $4,935. However, many budget expenses target special needs of rural areas, provide a safety net for low income or otherwise disadvantaged individuals, or pay for programs not tied to population like resource management or the legislature. It is assumed that OCS-related population growth will not increase the state budget for these items; the per capita cost for the OCS-related population across the weighted average of new infants, school-aged children, adults, and senior citizens are calculated based on this assumption (see Table 34). The result is a per capita state budget cost estimate of $3,717—75 percent of the average across all budget items.

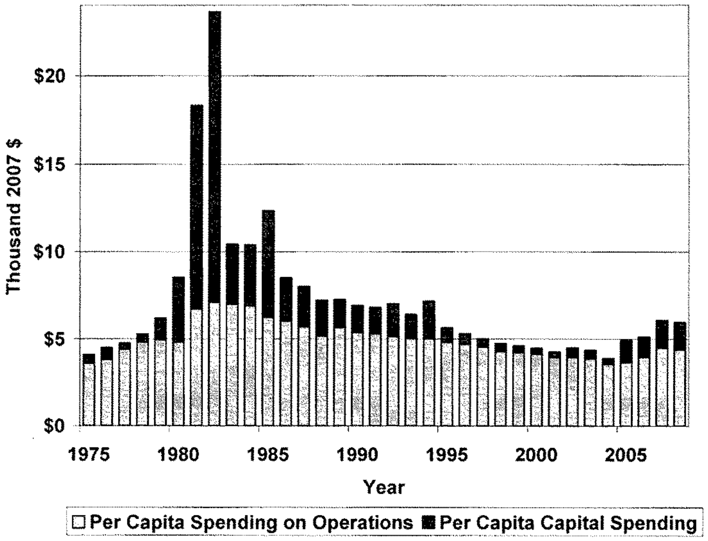
Table 34. Share of OCS Population and Per Capita Cost per Population Category

Population Category	Share of OCS Population (%)	Per Capita Cost ($)
Infant	7.2	-
School aged child	14.5	7,191
Adult	70.9	3,018
Senior Citizen	7.4	7,229
Weighted Average OCS Population		***3,717***

Source: ISER.

This estimate that 75 percent of the state general fund operating budget was sensitive to OCS related population growth was applied to the historical average per capita state general fund operating budget resulting in a per capita OCS population annual cost estimate of $3,510 (2007$). Figure 65 shows the historical trend in per capita spending until quite recently has been downward.

Figure 65. State Operations Spending Per Capita and Capital Spending Per Capita



Source: Alaska Legislative Finance and ISER.

After a further downward adjustment for economies of scale associated growth in the Alaska population and an upward adjustment to include capital expenditures, the final per capita figure is $3,396 (2007$). Thus, for each year that OCS development added one individual to the Alaska population, the state budget would need to increase by $3,396 to meet the needs created by that individual.

OCS development will also create state government costs associated with resource management, tax administration, environmental monitoring and other programs not related to the new population. These costs are estimated based on a review of current budgets associated with petroleum resource management, adjusted for the fact that most activity will be outside state jurisdiction.

The population growth that drives the increase in state government spending is contingent on the assumption that the historical pattern of labor force participation will continue in the future. Historically there has been significant underemployment in rural parts of the state at the same time that non-residents have moved into the state to fill new jobs. To the extent that more of the new jobs associated with OCS development could be taken by underemployed residents, the demand for new state public services would be lessened because the population growth from new migrants would be reduced.

4.6.2 Beaufort OCS

Potential cumulative incremental state revenues from the Beaufort OCS development scenario is estimated to be about $7.2 billion (2007$) between 2008 and 2057. These revenues would come from three different sources—direct OCS revenues (including 8(g) lease revenues, personal taxes, and indirect petroleum revenues.

The direct OCS revenues estimated to be about $400 million would consist primarily of corporate income taxes and the State's share of the state property tax on petroleum property (a larger share of the property tax would accrue to the North Slope Borough where the facilities would be located). These revenues would all go into the state general fund. There would also be a very modest amount of 8(g) revenue, which would be divided between the general fund and the Permanent Fund.

Estimated personal taxes associated with the Beaufort OCS development of about $1.8 billion would come primarily from the personal income tax (assumed in the analysis regardless of OCS development) but would also include various excise taxes and fees. These revenues would all be deposited in the general fund.

The indirect petroleum revenues estimated to amount to about $5 billion could come from four sources. The largest would be the estimated additional state royalty and production tax revenue ($2.9 billion) resulting from a reduction in the TAPS tariff and an increase in the wellhead value of oil due to additional throughput from Beaufort OCS oil. This estimate also includes the additional revenues to the State that could result from an extension of the life of TAPS. Because Beaufort OCS oil in the TAPS line would keep throughput above 200,000 barrels per day, this would forestall the need to shut down TAPS (assumed to happen in 2046) and find an alternative, and more expensive, method of shipping the remaining oil to market. Another significant source of indirect petroleum revenues from Beaufort OCS development is the additional state royalties and taxes that could result from the "stimulative" effect of higher industry profits due to higher wellhead values (a benefit due to increased TAPS throughput). Industry investment in exploration and development activities are anticipated to increase with higher industry profits that could lead to higher petroleum production in the North Slope. Other sources of indirect petroleum revenues could include benefits to the State from increased throughput in the gas pipeline from Beaufort OCS gas (estimated to be about $500 million) and the increase in on-shore petroleum production from marginal fields made possible by improved access to transportation and processing facilities as well as lower development costs stemming from OCS activities ($600 million).

Table 35 summarizes the potential state fiscal effect of the Beaufort OCS development scenario. Beaufort OCS activities are projected to result in a net fiscal balance of $3.1 billion.

Table 35. Estimated Cumulative State Revenue Balance, Beaufort OCS Development, 2008 to 2057 (in Billions of 2007$)

Category	Amount
Direct OCS Revenue Effects	**0.4**
Property tax	0.1
Corporate Income Tax	0.3
Shared Lease Revenues	--
Personal Taxes	**1.8**
Indirect Revenue Effects	**5.0**
TAPS- Full Pipeline Enhanced Value of North Slope Production	2.9
TAPS- Full Pipeline Additional North Slope Production	1.0
Gas Pipeline Tariff Reduction Effect	0.5
Incremental Production due to OCS Infrastructure	0.6
Total Revenues	**7.2**
Total Expenditures	**4.1**
Projected Net Fiscal Balance	**3.1**

Source: Northern Economics, Inc. and ISER estimates.

4.6.3 Chukchi OCS

The estimated cumulative incremental state revenues from the Chukchi OCS development scenario amount to about $7.4 billion (2007$) between 2008 and 2057. The resulting net fiscal balance to the State from the Chukchi OCS activities is projected to be $3.7 billion.

Direct OCS revenues from corporate income taxes and the State's share of the state property tax on petroleum property are estimated to be about $800 million. These revenues would all go into the state general fund. There would be no 8(g) revenues from the Chukchi OCS development.

Personal taxes of about $1.6 billion could come from the personal income tax associated with the Chukchi OCS activity but would also include various excise taxes and fees; these revenues would all be deposited in the state general fund.

The estimated indirect petroleum revenues associated with the Chukchi OCS development, estimated at $5 billion, are comparable to the projected Beaufort results. As in the Beaufort development, there are four potential additional benefits of OCS activity that are expected to generate indirect revenues to the State of Alaska. Table 36 shows the projected indirect revenues from each source.

Table 36. Estimated Cumulative State Revenue Balance, Chukchi OCS Development, 2008 to 2057 (in Billions of 2007$)

State Revenues	Amount
Direct revenue	**0.8**
Property tax	0.2
Corporate Income Tax	0.6
Shared Lease Revenues	--
Personal taxes	**1.6**
Indirect effects	**5.0**
TAPS- Full Pipeline Enhanced Value of North Slope Production	2.8
TAPS- Full Pipeline Additional North Slope Production	1.0
Gas Pipeline Tariff Reduction Effect	0.7
Incremental Production due to OCS Infrastructure	0.6
Total Revenues	**7.4**
Total Expenditures	**3.7**
Projected Net Fiscal Balance	**3.7**

Source: Northern Economics, Inc. and ISER estimates.

4.6.4 Combined Beaufort and Chukchi OCS Development

This section summarizes the combined fiscal effects of the Beaufort and Chukchi OCS development. As shown in Table 37, the combined total state revenues associated with the Beaufort and Chukchi OCS development, projected through 2057 could be about $14.6 billion. Estimated state government expenditures associated with the combined OCS development are $7.8 billion. In this combined case, the fiscal balance is $6.8 billion.

Table 37. Estimated Cumulative State Revenue Balance, Combined Beaufort and Chukchi OCS Development, 2008 to 2057 (in Billion of 2007$)

State Revenues	Amount
Direct revenue	**1.2**
Property tax	0.3
Corporate Income Tax	0.9
Shared Lease Revenues	--
Personal taxes	**3.3**
Indirect effects	**10.1**
TAPS- Full Pipeline Enhanced Value of North Slope Production	5.7
TAPS- Full Pipeline Additional North Slope Production	2.0
Gas Pipeline Tariff Reduction Effect	1.2
Incremental Production due to OCS Infrastructure	1.2
Total Revenues	**14.6**
Total Expenditures	**7.8**
Projected Net Fiscal Balance	**6.8**

Source: Northern Economics, Inc. and ISER estimates.

4.6.5 North Aleutian OCS

The North Aleutian OCS development scenario is projected to generate cumulative incremental state revenues of about $800 million (2007$) between 2008 and 2057.

The estimated direct revenues from corporate income taxes and the state's share of the state property tax on petroleum property amount to $200 million. These revenues would all go into the state general fund.

Personal taxes are projected to be about $600 million; primarily from a personal income tax but also including various excise taxes and fees. Personal taxes would all be deposited in the general fund.

No indirect petroleum revenues are anticipated from the North Aleutian OCS development since the development scenario does not anticipate other oil and gas development in the region. If other oil and gas development were anticipated then indirect petroleum revenues might be generated.

Table 38 shows the projected state government revenues and expenditures associated with OCS development in the North Aleutian Basin. The projected result is a net fiscal deficit of $200 million.

Table 38. Estimated Cumulative State Revenue Balance, North Aleutian Basin OCS Development, 2008 to 2057 (in Billions of 2007$)

State Revenues	Amount
Direct revenue	**0.2**
Property tax	0.1
Corporate Income Tax	0.1
Shared Lease Revenues	--
Personal taxes	**0.6**
Indirect effects	
TAPS- Full Pipeline Enhanced Value of North Slope Production	--
TAPS- Full Pipeline Additional North Slope Production	--
Gas Pipeline Tariff Reduction Effect	--
Incremental Production due to OCS Infrastructure	--
Total Revenues	**0.8**
Total Expenditures	**1.0**
Projected Net Fiscal Balance	**(0.2)**

Source: Northern Economics, Inc. and ISER estimates.

4.6.6 Combined All Three OCS Development

OCS development in all three areas—the Beaufort, Chukchi, and North Aleutian Basin— is projected to generate a positive net fiscal balance to the State of Alaska of about $6.6 billion.

As shown in Table 39, the estimated state government revenues from OCS development in all three areas ($15.3 billion) are expected to be greater than the estimated state government expenditures associated with OCS activity in all three areas ($8.8 billion)

Table 39. Estimated Cumulative State Revenue Balance, All Three OCS Development, 2008 to 2057 (in Billions of 2007$)

State Revenues	Amount
Direct revenue	**1.4**
Property tax	0.4
Corporate Income Tax	1.0
Shared Lease Revenues	--
Personal taxes	**3.9**
Indirect effects	**10.1**
TAPS- Full Pipeline Enhanced Value of North Slope Production	5.7
TAPS- Full Pipeline Additional North Slope Production	2.0
Gas Pipeline Tariff Reduction Effect	1.2
Incremental Production due to OCS Infrastructure	1.2
Total Revenues	**15.3**
Total Expenditures	**(8.8)**
Projected Net Fiscal Balance	**6.6**

Source: Northern Economics, Inc. and ISER estimates.
Note: Totals may not add due to rounding.

4.6.7 Potential Fiscal Effects for Local Governments

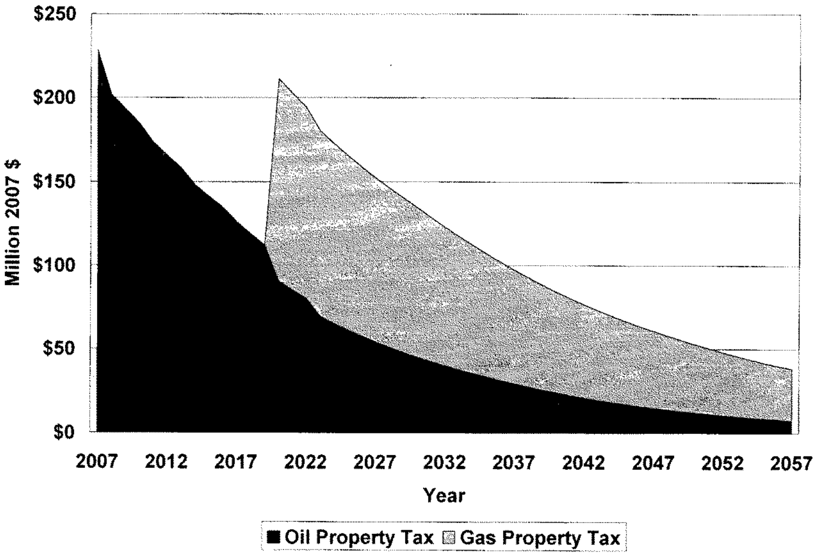
Local governments in the directly impacted regions have a limited number of revenue sources to pay for necessary local public services. The most important are revenues from resource production and limited local sales and property taxes. State government directly supports some services like education, and provides limited revenue sharing. The following sections discuss the potential fiscal effects of OCS development for impacted local governments.

4.6.7.1 Beaufort OCS

The North Slope Borough (Borough) relies on the property tax, which produced $28,700 per capita in 2006, primarily from revenues from the state property tax on petroleum property shared with the local jurisdictions where the property is located (Alaska Department of Commerce, Community, and Economic Development, 2007). Without OCS development, revenues from oil-related property are projected to decline in future years; however, the construction of a natural gas pipeline is expected to increase the taxable property in the region and increase Borough revenues. Over time, those revenues would also begin to fall as petroleum property depreciates (Figure 66).

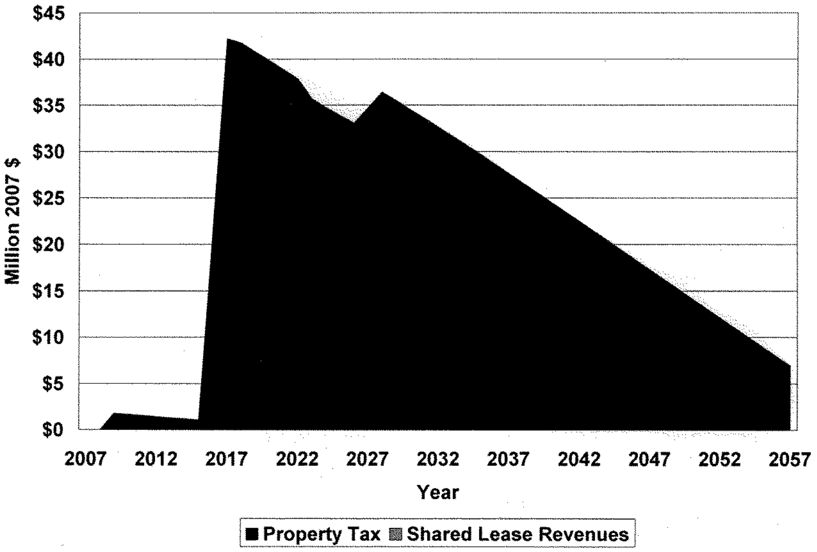
OCS development in the Beaufort is projected to generate additional property tax revenues for the Borough amounting to about $1 billion (cumulative through 2057). Over time, these revenues would also decline with the value of the onshore OCS related property (Figure 67). In addition, shared lease revenues from 8(g) leases could add a modest amount to total Borough revenues (estimated to amount to over $20 million through 2057); because the annual amounts are small they do not appear in Figure 67. Section 4.5.1.1 of this report provides more detail about the property taxes and 8(g) revenues.

Figure 66. Projected North Slope Borough Petroleum Revenues without Beaufort OCS Development



Source: ISER estimates.

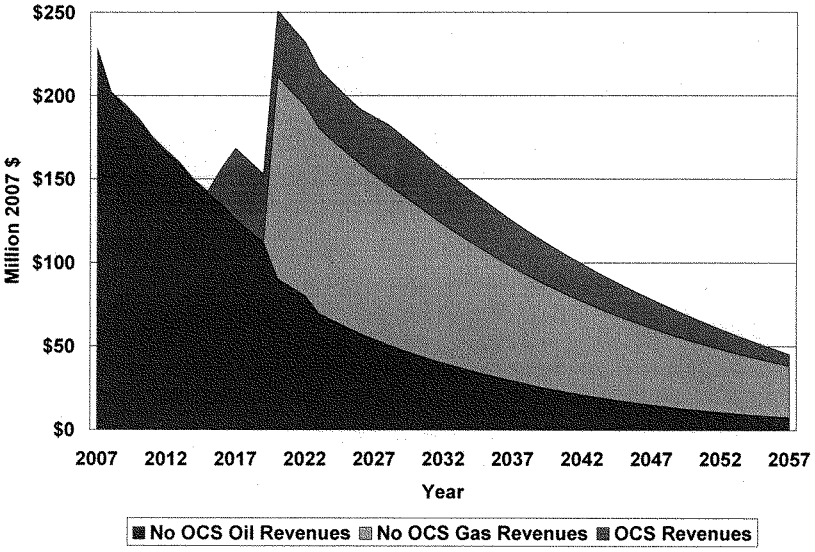
Figure 67. Estimated North Slope Borough Incremental Petroleum Revenues, Beaufort OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Figure 68 shows the total petroleum revenues that could accrue to the North Slope Borough with and without the Beaufort OCS development.

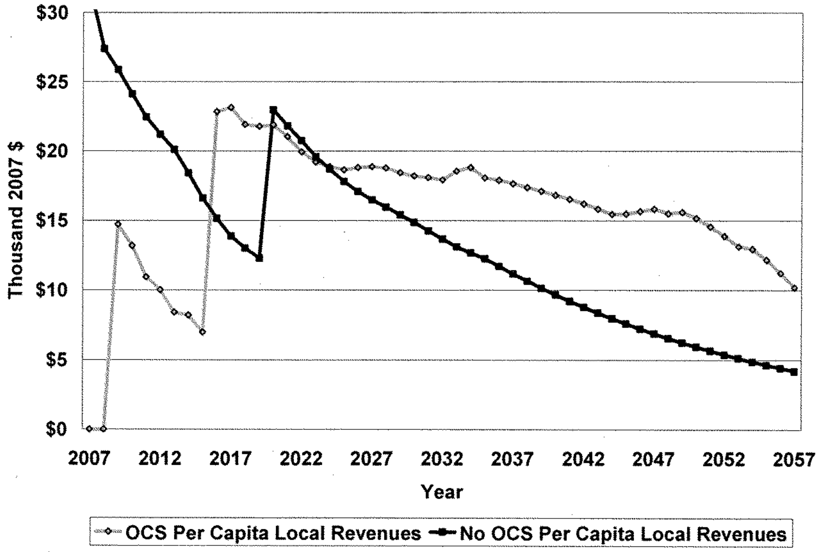
Figure 68. Estimated North Slope Borough Petroleum Revenues with and Without Beaufort OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Without OCS development, per capita local revenues trend downward except for the spike when the gas pipeline is built (Figure 69). OCS revenues per new resident are generally higher. (The percent increase in local revenues with OCS development is greater than the percent increase in local population with OCS development.)

Figure 69. Projected North Slope Borough Per Capita Local Revenues, Beaufort OCS Development



Source: ISER estimates.

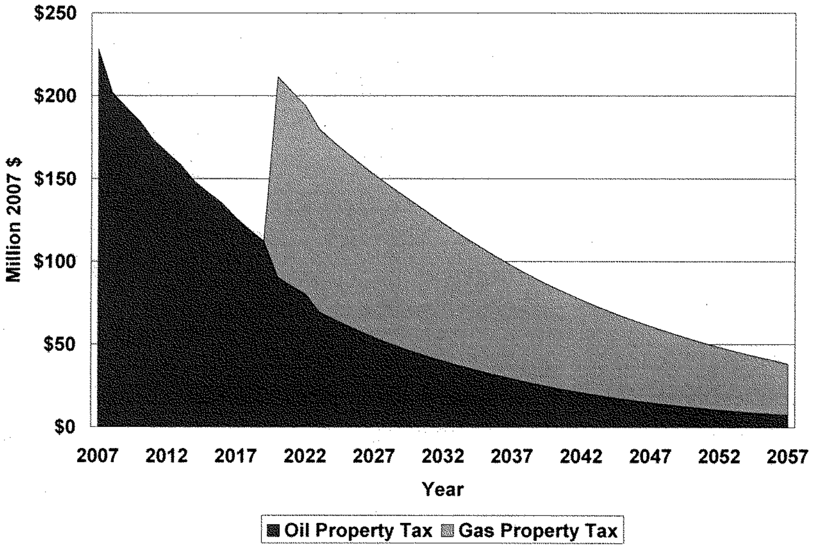
4.6.7.2 Chukchi OCS

Without OCS development in the Chukchi, the North Slope Borough is projected to continue to receive revenues, primarily from petroleum property taxes. Property taxes associated with the current oil facilities are projected to decline over time but additional property tax revenues are expected to be generated once the natural gas pipeline is built. Figure 70 shows the projected local property tax revenues without the Chukchi OCS development.

With OCS development in the Chukchi, Borough revenues are projected to increase by a total of about $2.4 billion through 2057. Property tax revenues generated over time are shown in Figure 71. There would be no lease revenues generated under the current federal sharing structure.

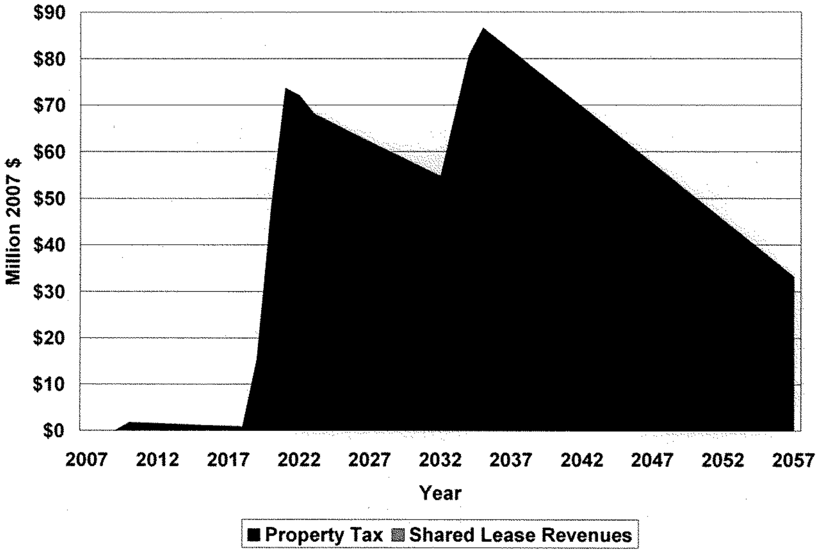
As illustrated in Figure 72, OCS revenues associated with the Chukchi development scenario could add a substantial amount to total Borough revenues.

Figure 70. Projected North Slope Borough Petroleum Revenues without Chukchi OCS Development



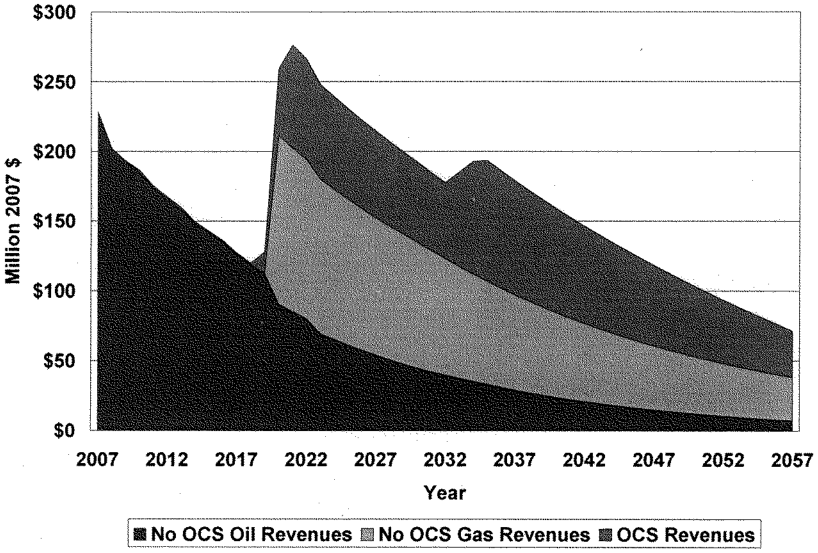
Source: Northern Economics, Inc. and ISER estimates.

Figure 71. Estimated North Slope Borough Incremental Petroleum Revenues, Chukchi OCS Development



Source: Northern Economics, Inc. and ISER estimates.

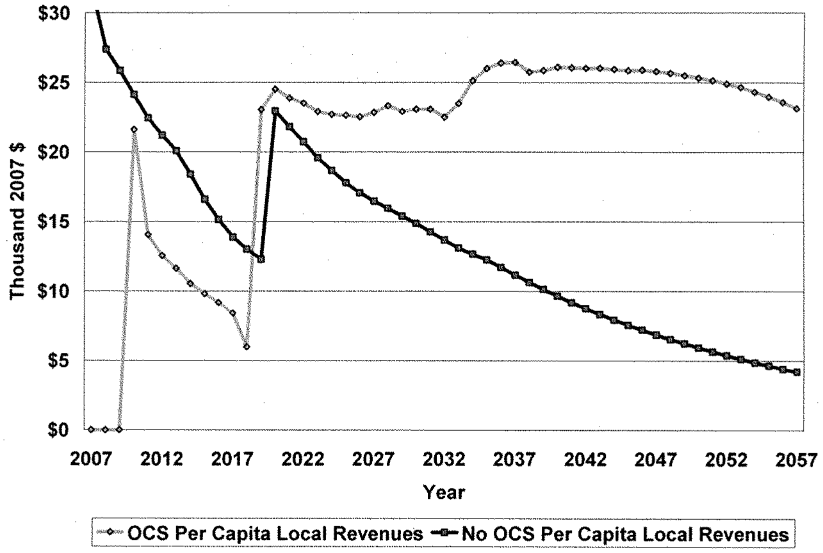
Figure 72. Estimated North Slope Borough Petroleum Revenue with and without Chukchi OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Without OCS development, per capita local revenues trend downward except for the spike when the gas pipeline is built (Figure 73). OCS revenues per new resident are generally higher. (The percent increase in local revenues with OCS development is greater than the percent increase in local population with OCS development.)

Figure 73. Projected North Slope Borough Per Capita Local Revenues, Chukchi OCS Development



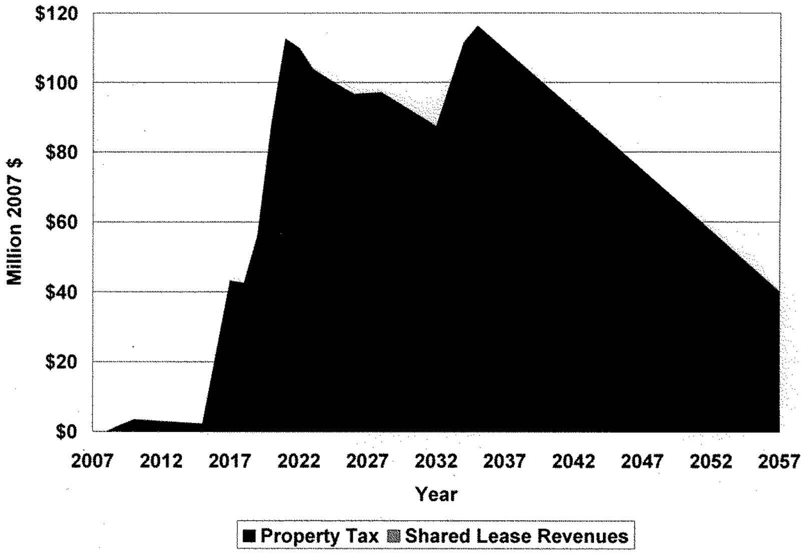
Source: ISER estimates.

4.6.7.3 Combined Beaufort and Chukchi OCS Development

Figure 74, Figure 75, and Figure 76 show the combined projected annual revenues to the North Slope Borough from OCS activity in the Beaufort and the Chukchi.

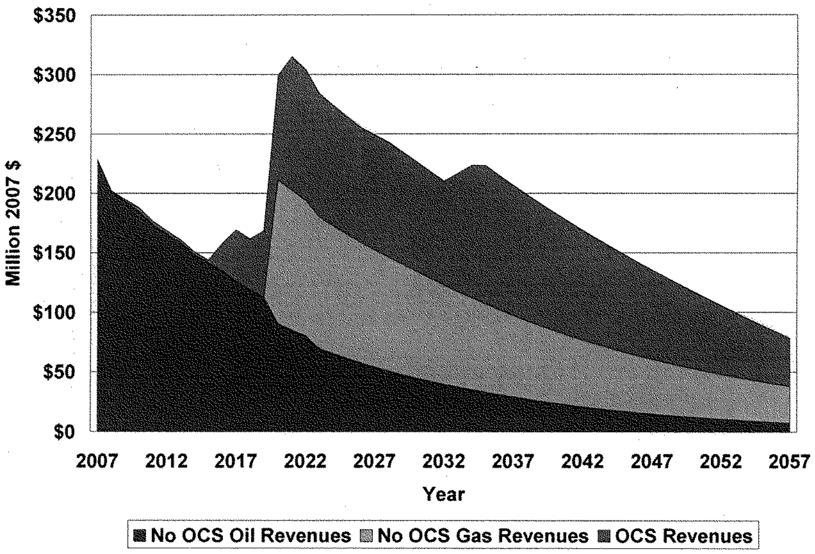
OCS development in both areas is expected to add significantly to North Slope Borough revenues. In property taxes, the combined results for the Beaufort and Chukchi are estimated to amount to about $3.5 billion through 2057.

Figure 74. Projected North Slope Borough Incremental Petroleum Revenue, Combined Beaufort and Chukchi OCS Development



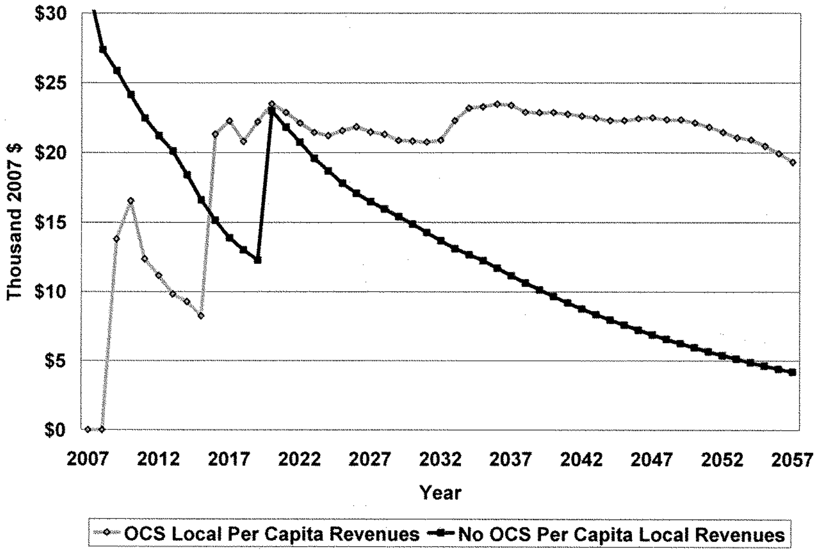
Source: Northern Economics, Inc. and ISER estimates.

Figure 75. Estimated North Slope Borough Petroleum Revenue with and without Combined Beaufort and Chukchi OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Figure 76. Projected North Slope Borough Per Capita Local Revenues, Combined Beaufort and Chukchi OCS Development

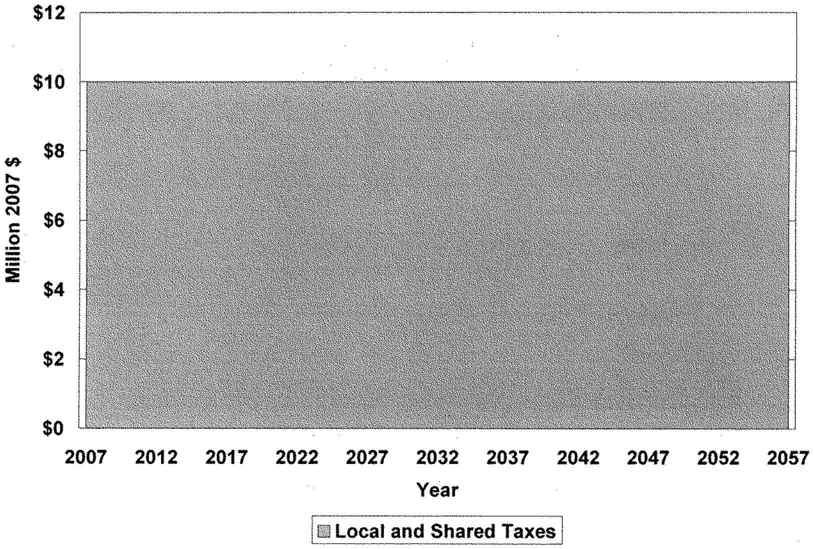


Source: ISER estimate

4.6.7.4 North Aleutian OCS

The North Aleutian Basin region relies on a mixture of local property and sales taxes as well as taxes on the seafood industry. In addition, most communities share in a portion of the state fishery business tax and fishery resource landing tax (as well as a number of other small shared taxes). Per capita revenues in 2006 from these local and shared taxes ranged from a high of $3,700 in the Bristol Bay Borough and $1,900 in the city of Dillingham, to a low of $800 in the small communities in the Lake and Peninsula Borough (Alaska Department of Commerce, Community, and Economic Development, 2007 and Alaska Department of Revenue, 2007). In the aggregate these revenues are quite modest—roughly $10 million annually. These revenues are projected to continue at their current level. Construction of the Pebble Mine will increase revenues to some communities within the region, but since that project is still in the early stages of planning it is too soon to estimate what those might be (Figure 77).

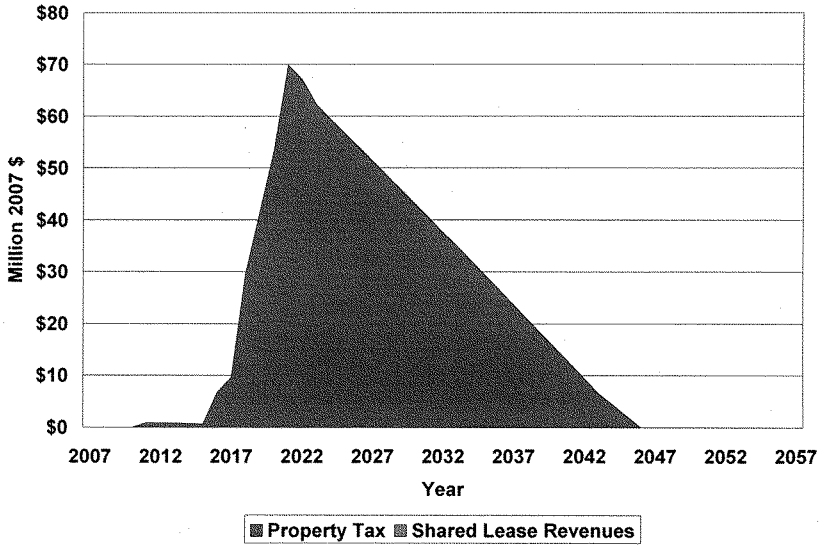
Figure 77. Projected Regional Revenue without North Aleutian OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Under the development scenario envisioned for the North Aleutian Basin, OCS development could generate significant property tax revenues for the region; these revenues would decline over time with the value of the oil and gas property (Figure 78). There would be no lease revenues under the current federal sharing structure.

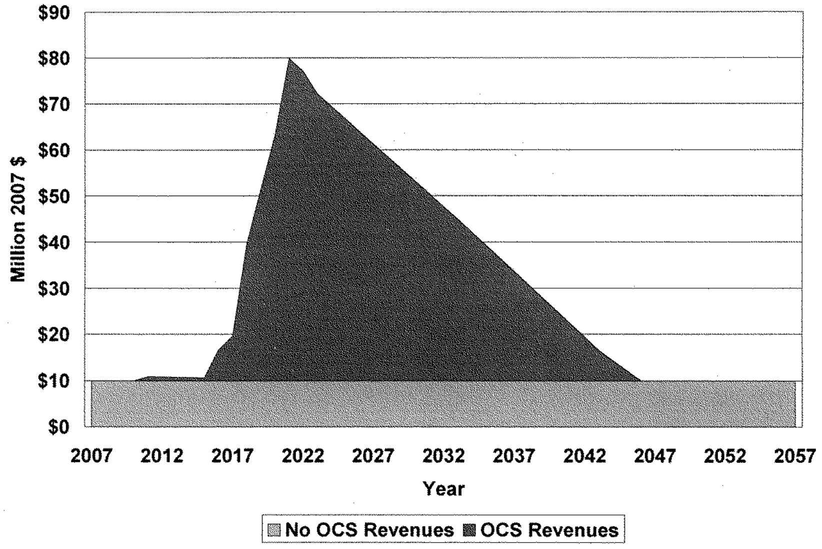
Figure 78. Estimated Incremental Petroleum Revenue, North Aleutian Basin OCS Development



Source: Northern Economics, Inc. and ISER estimates.

The OCS revenues could add significantly add to total regional revenues (Figure 79) given the development scenario for the Basin.

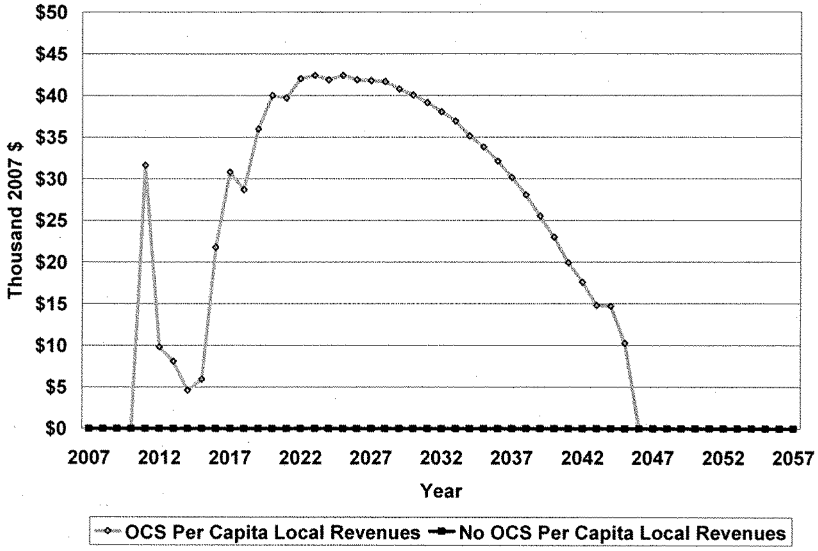
Figure 79. Estimated Petroleum Revenues with and without North Aleutian OCS Development



Source: Northern Economics, Inc. and ISER estimates.

Without OCS development, per capita local revenues are stable but low over time (Figure 80). OCS revenues per new resident could be several times higher. The percent increase in local revenues with OCS development could be greater than the percent increase in local population with OCS development.

Figure 80. Projected Aleutians East Borough Per Capita Local Revenues, North Aleutian OCS Development



Source: ISER estimates.

5 Sensitivity Analysis

A sensitivity analysis was done to consider OCS revenue effects given higher market prices for oil and gas (holding all other factors constant).

The base case analysis as presented in Section 4, assumed long-term (50-year) projected prices of oil and gas fluctuating around $65 per barrel and $6.4 per million Btu of natural gas, respectively, in 2006 dollars. These price assumptions are based on the Energy Information Administration's (EIA) June 2008 published petroleum price forecast[17].

For the sensitivity analysis, the following oil and gas price levels were assumed through 2030:

Case 1: Oil: $80 per barrel and natural gas: $7.8 per mmBtu

Case 2: Oil: $100 per barrel and natural gas: $9.8 per mmBtu

Case 3: Oil: $120 per barrel and natural gas: $11.8 per mmBtu

Prices after 2030 and through 2057 were assumed to increase at a rate of 0.5 percent per year (same assumption as the base case). The results are shown in Table 40.

Table 40. Sensitivity Analysis Results: Cumulative State Revenues under Different Petroleum Price Levels

Revenue/Expenditure Category	Base Case	Sensitivity Analysis		
		Case 1	Case 2	Case 3
Projected State Revenues	**15.3**	**16.0**	**17.1**	**18.2**
Direct OCS Petroleum Revenues	1.4	1.4	1.4	1.4
Population Related Revenues	3.9	3.9	3.9	3.9
Indirect Petroleum Revenues due to OCS development				
TAPS-Full Pipeline Enhanced Value of North Slope Production	5.7	5.7	5.7	5.7
TAPS-Full Pipeline Additional North Slope Production	2.0	2.4	3.1	3.8
Gas Pipeline Tariff Reduction Effect	1.2	1.2	1.2	1.2
Incremental Production due to OCS Infrastructure	1.2	1.5	1.9	2.3
Projected Incremental State Expenditures	**(8.8)**	**(8.8)**	**(8.8)**	**(8.8)**
Projected State of Alaska Net Fiscal Balance:	**6.6**	**7.2**	**8.3**	**9.4**

Notes: (1) The sum of the amounts may not equal the total due to rounding.

The economic benefits of the development of oil and gas resources from Alaska's OCS areas would be greater with higher prices—revenues would be higher, production could be higher, and consequently higher revenues and production would increase statewide employment and population.

Higher prices could have a significant impact on the indirect revenues. Higher prices are expected to result in greater oil and gas and production in the North Slope; thereby increasing the spillover effects from lower transportation costs and lower operating costs due to additional OCS infrastructure.

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[17] EIA's *Annual Energy Outlook* presents a projection and analysis of US energy supply, demand, and prices through 2030. The projections are based on results from EIA's National Energy Modeling System. Prices were projected to increase slowly in real dollars from 2030 until 2057. These price levels also approximate the Department of Revenue's 10-year oil price forecast—in 2017, DOR price forecast is $65.25 per barrel (in real 2008$) at ANS West Coast (DOR, Spring 2008 Forecast).

The impact on direct OCS petroleum revenues, however, could be insignificant as most of these revenues are tied to property taxes and not to lease revenues. Under a different federal lease revenue sharing arrangement such as the one in the Gulf of Mexico, the benefits to Alaska could be greater with higher oil prices.

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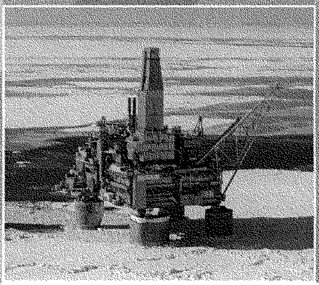

Potential National-Level Benefits of Alaska OCS Development

Prepared for

Shell Exploration and Production

February 2011

Northern
Economics
Wisdom • Trust • Relevance • Innovation

Institute of Social and Economic Research,
University of Alaska Anchorage

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Abbreviations

BOEMRE	Bureau of Ocean Energy Management, Regulation, and Enforcement
EIS	Environmental impact statement
EIA	Energy Information Administration
ERS	Financial Reporting System
ISER	Institute of Social and Economic Research
mmBtu	million British thermal units
NEI	Northern Economics, Inc.
NPR–A	National Petroleum Reserve-Alaska
NSB	North Slope Borough
OCS	Outer Continental Shelf
PI+	Policy Insight+
REMI	Regional Economic Models Inc.
TAPS	Trans-Alaska Pipeline System
TCF	trillion cubic feet
UERR	Undiscovered economically recoverable resource estimates
WTI	West Texas Intermediate crude oil

Executive Summary

In 2009, Northern Economics, Inc. and the Institute of Social and Economic Research at the University of Alaska Anchorage released a study that was commissioned by Shell Exploration and Production describing the potential economic benefits to the State of Alaska and local governments from developing oil and gas resources in Alaska's Outer Continental Shelf (OCS) areas, particularly the Beaufort Sea, Chukchi Sea, and the North Aleutian Basin.[1] The study showed that OCS development in those three areas could generate an annual average of 35,000 jobs in Alaska, total estimated payroll of $72 billion (2007$), $15 billion (2007$) in potential cumulative revenues to the State of Alaska, and over $4 billion (2007$) in estimated property tax payments to local governments, over a 50-year period.

The benefits of potential OCS development in Alaska extend beyond the state however—OCS leases generate direct revenues to the federal government and the increase in economic activity associated with exploration, development, and production of OCS oil and gas resources would also generate jobs, income, and additional tax revenues to the rest of the nation.

This study quantifies these other economic benefits beyond Alaska, focusing on estimated government take and employment effects on the rest of the nation. This follow-up study only considers development in the Beaufort Sea and the Chukchi Sea OCS; no activity is anticipated in the North Aleutian Basin. On March 3, 2010, the Secretary of the Interior Ken Salazar announced that as part of the Obama Administration's plan for the protection of special areas like the Bristol Bay in Alaska, the planning area (North Aleutian Basin) would be withdrawn from consideration for oil and gas development through 2017 (U.S. Department of the Interior, 2010).

The following key findings are based on a reasonable set of exploration, development, and production scenarios developed in the 2009 study for the Beaufort and Chukchi OCS areas.

Key Findings

- Commercialization of oil and gas resources in the Beaufort OCS and the Chukchi OCS, could generate $97 billion and $96 billion (in 2010$), respectively, in revenues to federal, state, and local governments, over a 50-year period.
- Economic activity resulting from OCS development in the Beaufort Sea and Chukchi Sea could generate an annual average of 54,700 jobs nationwide, with an estimated cumulative payroll amounting to $145 billion (in 2010$) over the next 50 years. It is estimated that about 30,100 jobs would be generated from the Beaufort OCS development and 24,600 jobs from development of the Chukchi Sea OCS.

Table ES-1 and Table ES-2 summarize the estimated cumulative potential government revenues by entity and by revenue category accruing from exploration, development, and production activities in the Beaufort OCS and the Chukchi OCS, respectively. The values are expressed in 2010 U.S. dollars[2].

Table ES-3 summarizes the potential employment effects in Alaska and the rest of the nation of exploration, development, and production activities in the Beaufort and Chukchi OCS areas.

Table ES-4 summarizes the results of the sensitivity analysis showing the effects of varying market prices for oil and gas on potential government revenues. As shown in the table, estimated government take from corporate income tax receipts, lease revenues, and indirect revenues from new production due to lower tariff and expanded infrastructure, increase with higher market prices for oil and gas.

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[1] View the complete 2009 report at: http://www.northerneconomics.com/ShellOCS.

[2] The original study presented results in 2007 dollars. All the figures in this report are in 2010 dollars.

Table ES-1. Summary of Estimated Cumulative Government Revenues by Entity from Beaufort OCS Development, 2008 to 2057

Category	State of Alaska	North Slope Borough	Federal Government	Other State Governments	Total
			($2010 Millions)		
Direct Revenues					
Property Tax	94	1,163	-	-	1,257
Corporate Income Tax	236	-	26,684	-	26,919
Lease Revenues	25	-	48,170	-	48,195
Non-Petroleum Revenues					
Personal Income Tax	-	-	5,488	1,447	6,935
Potential Future Income Tax[1]	1,518	-	-	-	1,518
Other Taxes and Fees	440	-	1,590	2,283	4,314
Indirect Revenues[2]					
Value (Full Oil Pipeline)	3,064	-	1,608	-	4,672
Value (Extend Life of Oil Pipeline)					
Volume (New Production from Lower Tariff)	1,008	14	470		1,492
Volume (New Production from Expanded Infrastructure)	712	9	332	-	1,053
Value (Full Gas Pipeline)	528	-	277	-	805
Total:	**7,626**	**1,185**	**84,619**	**3,731**	**97,161**

Source: NEI and ISER estimates, 2010.

Notes:

[1] The state does not currently have either a general sales tax or a personal income tax. However, the non-OCS projection of future state population and public sector demands compared to revenues suggests that a number of adjustments to the state's fiscal structure will be necessary in future years to maintain adequate public services. Two options available to the state, in addition to reducing expenditures, are institution of a broad-based tax, and use of a portion of the earnings of the Permanent Fund. (Additional taxes on other resource industries could generate only very modest revenues.) It is anticipated that both options will be required in the non-OCS case. The value shown above assumes a personal income tax, similar to the tax that was eliminated in 1980, will be phased in between 2022 and 2026. This personal income tax will be the largest source of population-related revenues from OCS development because the tax base will be the entire payroll generated by the OCS development. It is assumed that the alternative of a statewide sales tax would generate an equivalent amount of revenue.

[2] In the previous study, these sources of indirect or spinoff revenues from petroleum activity in the North Slope were identified. These indirect revenues are generated as a result of lower cost of petroleum production and transportation generated by OCS development.

Table ES-2. Summary of Estimated Cumulative Government Revenues by Entity from Chukchi OCS Development, 2008 to 2057

Category	State of Alaska	North Slope Borough	Federal Government	Other State Governments	Total
			($2010 Millions)		
Direct Revenues					
Property Tax	202	2,491	-	-	2,693
Corporate Income Tax	611	-	24,790	-	25,401
Lease Revenues	-	-	48,692	-	48,692
Non-Petroleum Revenues					
Personal Income Tax	-	-	4,608	1,104	5,713
Potential Future Income Tax	1,276	-	-	-	1,276
Other Taxes and Fees	361	-	1,304	1,743	3,408
Indirect Revenues					
Value (Full Oil Pipeline)	2,989	-	1,569	-	4,558
Value (Extended Life of Oil Pipeline)	132	264	335		731
Volume (New Production from Lower Tariff)	1,062	14	495	-	1,571
Volume (New Production from Expanded Infrastructure)	387	9	480	-	877
Value (Full Gas Pipeline)	705	-	370	-	1,076
Total:	**7,726**	**2,778**	**82,645**	**2,847**	**95,995**

Source: NEI and ISER estimates, 2010.

Note: See Table ES-1 notes.

Table ES-3. Estimated Employment Effects of OCS Development in the Beaufort and Chukchi OCS Areas, in Alaska and the Rest of the United States

	Beaufort OCS			Chukchi OCS			Both Areas
Category	Alaska	Rest of U.S.	Total	Alaska	Rest of U.S.	Total	
Annualized Average							
Entire Timeframe	13,700	16,400	30,100	12,500	12,100	24,600	54,700
Production Phase	16,900	20,300	37,200	16,200	15,200	31,400	68,600
Peak Employment	18,400	32,800	51,200	19,500	20,800	40,300	

Source: NEI and ISER estimates, 2010.

Table ES-4. Estimated Cumulative Government Take under Various Price Levels by Category and by Entity, Combined Beaufort and Chukchi OCS Development (in 2010$ millions)

Category	Base Case $65/barrel $6.4/mmBtu	Case 1 $80/barrel $7.8/mmBtu	Case 2 $100/barrel $9.8/mmBtu	Case 3 $120/barrel $11.8/mmBtu
Direct Revenues				
Property Tax	3,950	3,950	3,950	3,950
Corporate Income Tax	52,320	59,595	76,759	93,923
Lease Revenues	96,887	109,876	140,525	171,175
Non-Petroleum Revenues				
Personal Income Tax	12,648	12,648	12,648	12,648
Potential Income Tax	2,794	2,794	2,794	2,794
Other Taxes and Fees	7,721	7,721	7,721	7,721
Indirect Revenues				
Value (Full Oil Pipeline)	9,230	9,230	9,230	9,230
Value (Extend Life of Oil Pipeline)	731	731	731	731
Volume (New Production from Lower Tariff)	3,064	3,144	4,019	4,893
Volume (New Production from Expanded Infrastructure)	1,930	1,980	2,532	3,082
Value (Full Gasline)	1,881	1,881	1,881	1,881
Total:	**193,156**	**213,550**	**262,790**	**312,028**

Source: NEI and ISER estimates, 2010.

1 Introduction

This study is a follow-up to the report released by Northern Economics, Inc. (NEI) and the Institute of Social and Economic Research (ISER) for Shell Exploration & Production in March 2009. The 2009 study entitled *Economic Analysis of Future Oil and Gas Development: Beaufort Sea, Chukchi Sea, and North Aleutian Basin* quantified the potential economic benefits of Outer Continental Shelf (OCS) development to the State of Alaska and local communities. The results of the study showed that OCS development in those three areas could generate an annual average of 35,000 jobs in Alaska, total estimated payroll of $72 billion (2007$), $15.3 billion (2007$) in potential cumulative revenues to the State of Alaska, and $4.5 billion (2007$) in estimated property tax payments to local governments, over a 50-year period.

The objective of this subsequent research is to quantify potential national-level benefits of economic activity associated with exploration, development, and production of oil and gas resources in the Beaufort and Chukchi OCS areas in Alaska; excluding the North Aleutian Basin. On March 3, 2010, the Secretary of the Interior Ken Salazar announced that as part of the Obama Administration's plan for the protection of special areas like the Bristol Bay in Alaska, the North Aleutian Basin planning area would be withdrawn from consideration for oil and gas development through 2017 (U.S. Department of the Interior, 2010).

The economic benefits described in this study are based on reasonable assumptions that were developed in the 2009 study about future OCS development. In order to quantify the potential effects of oil and gas development in the OCS, a set of scenarios that reflect possible industry-wide exploration, development, and production activities for each OCS area was developed.[3] This set of scenarios represents only one possible picture of the future. The scenarios used were based in part on the scenarios discussed by the Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE) in published Environmental Impact Statements (EIS) and other materials.[4] The scenarios include assessments of oil and gas resources,[5] expected levels of exploration activities, development of oil and gas fields and required infrastructure, and operations and maintenance activities at the assumed production levels.

As in the previous study, it is assumed that development would occur given certain price and cost assumptions and that there will be no major regulatory impediments or delays to OCS development.

The assumptions used in the 2009 study are summarized below to provide context to the economic analysis in this follow-up study. Table 1 provides details on the Beaufort and Chukchi Sea OCS development scenarios.

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[3] BOEMRE, formerly the Minerals Management Service (MMS), the federal agency that manages OCS areas, develops exploration, development, and production scenarios for use in their environmental assessments and environmental impact studies. The scenarios developed by BOEMRE for these OCS areas were used as a starting point for this analysis. Major departures from the BOEMRE assumptions/scenarios include: 1) gas production in the Beaufort and Chukchi; 2) new on-shore facilities in the Beaufort; 3) updated resource estimates using the *2006 BOEMRE Resource Assessment*; and 4) adjustments in timing and level of exploration and development activities to reflect changes in technology and resource potential, and to incorporate insights from industry and BOEMRE staff regarding recent experience operating in arctic conditions and in areas of greater water depths.

[4] The recent Draft Environmental Impact Statement for the *Beaufort and Chukchi Sea Planning Areas, Oil and Gas Lease Sales 209, 212, 217, and 221* was issued after the analysis for this report was completed. The scenarios used in this report are based on earlier scenarios and other material that are broader in scope and duration than the November 2008 draft EIS.

[5] The resource assessments are based on analyses of geology, development costs, and timing, as well as oil and gas prices.

Beaufort Scenario

- Exploration drilling occurs over 15 years with one to three drilling rigs per season.
- Development includes construction of seven offshore production platforms, offshore pipelines, on-shore pipelines that connect to the Trans-Alaska Pipeline System (TAPS) and a future gas pipeline, as well as new on-shore facilities.
- Production assumes first oil in 2019 and first gas in 2029, with seven fields producing a total cumulative volume of about five billion barrels of oil through 2045 and seven trillion cubic feet of gas through 2057.

Chukchi Scenario

- Exploration drilling occurs over 24 years with one to two drilling rigs per season.
- Development includes construction of four offshore production platforms, offshore pipelines, on-shore pipelines across the National Petroleum Reserve – Alaska (NPR–A) to connect to the TAPS and a future gas pipeline from the North Slope. A new shore base[6] on the Chukchi coast is assumed to be constructed to support offshore exploration and development; other on-shore facilities are also assumed to be required to support production activities.
- Production assumes first oil in 2022 and first gas in 2036, with four fields producing a total cumulative volume of 4.8 billion barrels of oil and 7.8 trillion cubic feet of gas through 2057.

Price Assumptions

The long term assumptions about petroleum price were based upon projections from the 2008 Annual Energy Outlook of the Energy Information Administration (EIA) of the US Department of Energy. The Annual Energy Outlook projected the price of crude oil to fall in a range between $56 and $83 per barrel (2006$) and the price of gas to fall in a range between $5.8 and $7.4 per mmBtu (2006$) through 2030. Beyond that time, a growth rate of 0.5 percent per annum (in real $) was assumed.

A sensitivity analysis considering higher price assumptions was also conducted and is presented in Section 7 of this report.

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[6] A shore base is an on-shore facility that will be used for staging people and equipment during exploration, and later on to support construction and production activities. The base will likely serve as living quarters for industry workers as well as the transportation, storage, and communication hubs for all of the offshore activities.

Table 1. Summary of Development Scenarios in the Beaufort and Chukchi OCS Areas

	Beaufort OCS	Chukchi OCS
Resource Size (Mean)		
Oil and condensates (billion barrels)	5.97	8.38
Gas (trillion cubic feet)	15.94	34.43
Exploration		
Exploration/Delineation Wells	47	43
Exploration Rig Seasons	31	27
Development		
No. of offshore production platforms	7	4
Offshore/Onshore pipelines (miles)	235	680
Shore bases / facilities		
Marine terminal	*yes*	*yes*
Liquefied natural gas (LNG) facility	*no*	*no*
Production facility	*yes*	*yes*
Support base	*yes*	*yes*
Production		
Year 1st oil flows	2019	2022
Year 1st gas flows	2029	2036
No. of producing fields	7	4
Total cumulative volume produced (through 2057)		
Oil & gas (billion barrels of oil equivalent)	6.34	6.16
Oil & condensates (billion barrels)	5.10	4.79
Gas (trillion cubic feet)	6.96	7.78
Daily peak production		
Oil & condensates (barrels per day)	1,165,707	565,472
Gas (million cubic feet per day)	883	1,421

Source: NEI and ISER, 2009.

Note: The resource size estimates are from the 2006 BOEMRE Resource Assessment. The numbers shown in the table are the mean undiscovered economically recoverable resource estimates (UERR) assuming resource commodity prices of $60 per barrel of oil and $9.07 per thousand cubic feet of natural gas.

Given the level of exploration, development, and production activities in the Beaufort and Chukchi OCS areas, this study shows that the federal government and other states outside of Alaska are expected to receive significant financial benefits from OCS lease payments, taxes, and other fees associated with the increase in economic activity resulting from exploration, development, and production of OCS oil and gas resources. Moreover, oil and gas sector jobs, manufacturing jobs, jobs in the trade and services sector, and other support sector jobs would also be generated in the rest of the nation to support the OCS activities in Alaska.

The rest of this report describes the analysis and results of the national-level economic benefits of OCS development in the two Alaska OCS areas. The discussion is organized according to the tasks outlined in the scope of work requested by Shell Exploration & Production, as follows: 1) Direct and indirect Alaska and local government revenues, 2) Federal lease revenues, 3) Federal corporate income tax revenues, 4) Federal personal income tax, 5) Additional indirect revenues to federal and other state governments, 6) Sensitivity Analysis, and 7) Total jobs generated in Alaska and the rest of the nation.

2 Direct, Non-Petroleum, and Indirect Alaska and Local Government Revenues

The values shown in Table 2 and Table 3 are estimated cumulative state and local government revenues over the 50-year period resulting from the development and commercialization of petroleum resources in the Beaufort and Chukchi OCS.[7] Table 4 presents the combined results for the Beaufort and the Chukchi OCS. These results are primarily summarized from the 2009 study with adjustments in units from 2007 dollars to 2010 dollars, and additional estimated indirect revenues to local governments.

Direct Revenues

Three categories of direct revenues that would potentially accrue to the State of Alaska and the North Slope Borough are estimated: 1) property taxes, 2) state corporate income taxes, and 3) shared lease revenues.

The State of Alaska collects a property tax on petroleum-related property located onshore and a corporate income tax on a portion of income generated by OCS activities. The state property tax estimate is based on the share of total infrastructure associated with OCS production that is located on shore. Most of the tax is passed through to local jurisdictions within which the infrastructure is located, so the state retains just a small share of the total amount collected.

The state corporate income tax liability is based on the percentage of worldwide corporate profits attributable to activities in Alaska—determined by a three-part allocation formula including the shares of worldwide production, sales, and property based in Alaska. OCS activity would increase worldwide profits for any company. Alaska corporate income tax revenue would increase for a company with no Alaska onshore activity (or no activity elsewhere in the world) since the onshore portion of OCS related property would be attributed to Alaska in the allocation formula and increase the percentage of worldwide corporate profits attributable to activities in Alaska. For a company with existing onshore activity in Alaska, the allocation formula would fall with the addition of mostly offshore OCS production, so the percentage of worldwide profits attributable to activities in Alaska would fall. The Alaska tax liability of such a company would fall or rise depending on whether the percent drop in the Alaska formula was greater or less than the percent increase in worldwide profits. A modest increase in corporate income tax revenues from activities in the Alaska OCS is assumed.

The state also receives a share of bonuses and lease revenues on federal tracts between three and six miles offshore (known as 8(g) common pool lands).

Non-Petroleum Revenues

Non-petroleum revenues are generated from non-petroleum business activity supportive of OCS development as well as household income resulting from OCS development.

Besides the direct corporate income taxes that would be collected by the State of Alaska, various excise taxes on motor fuels, alcohol, and tobacco would also be generated due to increase in economic activity in the state.

Although the state does not currently have a personal income tax or a statewide general sales tax, it is anticipated that based on fiscal projections, the state will be forced to impose one or both in the future as revenue from petroleum production on state lands continues to decline. A state personal income tax is assumed to be phased in during the decade after 2020. Income tax revenues attributed to OCS development in this report are from the additional new payroll associated with OCS development only, including petroleum-related workers and workers in supporting businesses.

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[7] Estimated Chukchi revenues are slightly higher than reported in the original study because of inclusion of state property tax revenues from extended life of the oil pipeline.

Indirect Revenues

Indirect revenues result from the increased value and volume of petroleum production from state and non-OCS federal lands in Alaska because OCS production reduces development and production costs. Five enhancements to production on state and non-OCS federal lands from OCS development were considered and the indirect revenues associated with each enhancement were estimated.

1. **Value (Full Oil Pipeline)**—OCS oil production would add to the existing flow of oil through the existing oil pipeline, so the tariff (inversely related to throughput) would be reduced and the wellhead value of non-OCS oil would increase. The higher wellhead value of non-OCS oil would increase state revenue from the production and corporate income taxes as well as from royalties. Federal and state corporate income tax revenues would increase as well.
2. **Value (Extend Life of Oil Pipeline)**—OCS oil production would extend the life of the oil pipeline that otherwise would cease to operate when daily throughput fell below a threshold level of about 200,000 barrels per day. The value of the pipeline would be enhanced with extension of the operating life of the oil pipeline. (This occurs only in the Chukchi development case.) The state would collect additional property tax revenue from the extended life of the pipeline and most of this additional revenue would pass through to local governments. The state would also collect some additional corporate income tax revenue because the onshore pipeline would increase the share of worldwide income subject to the state tax compared to an offshore transportation system for the remaining North Slope oil. Federal and state corporate income tax revenues would increase because of the additional pipeline profits produced by its longer life.
3. **Volume (New Production from Lower Tariff)**—A lower tariff would result in higher wellhead value for North Slope oil and enhance the profitability of marginal oil production from state and non-OCS federal lands. This would result in a modest increase in production from existing fields (estimated at 141 million barrels). The production increase would generate state revenue from the production, corporate income, and property taxes as well as royalties. (It is assumed that this production is on state land.) Most of the property tax revenues would pass to local government. Federal corporate income tax revenue would also increase.
4. **Volume (New Production from Expanded Infrastructure)**—The increase in and extension of infrastructure on the North Slope from OCS development would enhance the profitability of marginal oil fields and result in a modest expansion of production from these fields (87 million barrels). The production increase would generate state revenue from the production, corporate income, and property taxes as well as royalties. We assume the enhanced production associated with Chukchi OCS development takes place on federal land (NPR–A) where the royalties are shared equally between the federal government and the state. The enhanced production associated with Beaufort development takes place on state land. Most of the property tax revenues would pass to local government. Federal corporate income tax revenue would also increase, and the federal government would also collect the royalties from NPR–A development, retaining 50 percent and passing the other 50 percent to the state.
5. **Value (Full Gasline)**—OCS production would increase the flow of gas through a gas pipeline, so the tariff would be reduced and the wellhead value of non-OCS gas would increase. (It is assumed that the value of non-OCS production increases but that there is no increase in the volume of non-OCS production.) The higher wellhead value of non-OCS gas would increase state

revenue from the production and corporate income taxes as well as from royalties. Federal corporate income tax revenue on that production would increase as well.

Table 2. Estimated Cumulative State of Alaska and North Slope Borough Revenues from Beaufort OCS Development, 2008 to 2057

	State of Alaska	North Slope Borough	Total
Category		($2010 Millions)	
Direct Revenues	**355**	**1,163**	**1,518**
Property Tax	94	1,163	1,257
State Corporate Income Tax	236	-	236
Shared Lease Revenues	25	-	25
Non-Petroleum Revenues	**1,958**	**-**	**1,958**
Indirect Revenues	**5,312**	**23**	**5,335**
Value (Full Oil Pipeline)	3,064	-	3,064
Value (Extended Life of Oil Pipeline)	-	-	-
Volume (New Production from Lower Tariff)	1,008	14	1,022
Volume (New Production from Expanded Infrastructure)	712	9	721
Value (Full Gas Pipeline)	528	-	528
Total:	**7,626**	**1,185**	**8,811**

Source: NEI and ISER, 2009 study; and 2010 estimates.

Table 3. Estimated Cumulative State of Alaska and North Slope Borough Revenues from Chukchi OCS Development, 2008 to 2057

	State of Alaska	North Slope Borough	Total
Category		($2010 Millions)	
Direct Revenues	**813**	**2,491**	**3,304**
Property Tax	202	2,491	2,693
State Corporate Income Tax	611	-	611
Shared Lease Revenues	-	-	-
Non-Petroleum Revenues	**1,637**	**-**	**1,637**
Indirect Revenues	**5,276**	**287**	**5,563**
Value (Full Oil Pipeline)	2,989	-	2,989
Value (Extended Life of Oil Pipeline)	132	264	396
Volume (New Production from Lower Tariff)	1,062	14	1,077
Volume (New Production from Expanded Infrastructure)	387	9	396
Value (Full Gas Pipeline)	705	-	705
Total:	**7,726**	**2,778**	**10,504**

Source: NEI and ISER, 2009 study; and 2010 estimates.

Table 4. Estimated Cumulative State of Alaska and North Slope Borough Revenues from Beaufort and Chukchi OCS Development, 2008 to 2057

Category	State of Alaska	North Slope Borough	Total
		($2010 Millions)	
Direct Revenues	**1,169**	**3,654**	**4,822**
Property Tax	296	3,654	3,950
State Corporate Income Tax	847	-	847
Shared Lease Revenues	25	-	25
Non-Petroleum Revenues	**3,595**	**-**	**3,595**
Indirect Revenues	**10,588**	**309**	**10,897**
Value (Full Oil Pipeline)	6,052	-	6,052
Value (Extended Life of Oil Pipeline)	132	264	396
Volume (New Production from Lower Tariff)	2,071	28	2,099
Volume (New Production from Expanded Infrastructure)	1,100	17	1,117
Value (Full Gas Pipeline)	1,233	-	1,233
Total:	**15,352**	**3,963**	**19,315**

Source: NEI and ISER, 2009 study; and 2010 estimates.

3 Federal Lease Revenues

OCS leases generate bonus bids, rental payments, and royalty payments to the federal government. A description of each of the various lease revenue types is presented below, followed by an estimate for total federal lease revenues.

Lease Revenue Types

Bonus bids are cash payments paid to the federal government in exchange for the right to explore and develop the petroleum reserves in OCS areas. Companies/explorers participate in a sealed bid auction to lease tracts of land during scheduled area-wide lease sales.

Bonus bids are generated at the time the area-wide lease sales occur. The model estimates bonus bids based on historical patterns. Typically, succeeding lease sales generate fewer bids because the best prospects have been previously leased. In the Chukchi, therefore, it is expected that the next lease sale will generate significantly fewer bonus bids than the 2008 lease sale. Revenues from bonus bids were assumed in the model to follow BOEMRE's planned lease sales in the Beaufort (2009 and 2011), and the Chukchi (2010 and 2012). The results of the recent Chukchi lease sales that generated $2.66 billion in bonus bids have been incorporated into the model.

A ***rental payment*** is established in the lease agreement and made to the lessor (BOEMRE) every year. However, there is no rental payment once production begins. BOEMRE does not place a lease back on annual rental status once production has begun, even though production has stopped and the lease is still in its primary term. In such cases, the lessee pays minimum royalty, which for BOEMRE is calculated at the same rate as the rental. Rental rates vary per year and are usually specified in the Final Notice of Sale. The model assumes a flat rental rate of $7.50 per acre for the Beaufort and Chukchi leases.

A ***royalty*** is a share of the minerals produced from a lease. It is a percentage of production paid either in money or in kind that a federal lessee is required to pay. On the Alaska OCS, typically a 12.5 percent royalty rate is applied for OCS leases that are in production. A minimum royalty payment is typically established as part of the lease agreement. The lessee pays BOEMRE a minimum royalty at the expiration of each lease year with a credit applied for actual royalty paid during the lease year.

Under certain circumstances, a royalty relief or suspension is granted by the Secretary of the Interior to promote increased oil and gas production. The royalty suspension is prorated by lease acreage and is subject to price thresholds. This analysis assumes, given the projected oil and gas prices, that no royalty suspension would apply to any of the Alaska OCS leases.

For the purpose of this analysis, royalties were estimated based on projected oil prices fluctuating around $65 per barrel in constant dollars and natural gas (Henry Hub) prices fluctuating around $6.40 per mmBtu for the period between 2008 and 2030, and then increasing at one-half of one percent per year through 2057. The price assumptions through 2030 are based on publicly available long-term price projections for oil and natural gas generated by the EIA (Annual Energy Outlook 2008). The Annual Energy Outlook presents a projection and analysis of U.S. energy supply, demand, and prices through 2030. The projections are based on results from the EIA's National Energy Modeling System. The implications of higher prices on the potential revenue effects are discussed in Section 7. To calculate the royalties, netback prices for oil and gas were used. The netback price reflects the price of the resource at the point of production (market price less transportation costs).

The estimated federal lease payments were generated using the revenue models developed in the March 2009 study for Shell Exploration and Production released in March 2009.

Estimated Federal Government Take from Beaufort OCS Lease Payments (in 2010$)

Total cumulative federal government take from lease revenues in the Beaufort OCS is estimated to amount to $48.2 billion over the 50-year period. This amount includes bonus bids, rental payments, and royalty payments. Royalty payments account for the majority of the lease payments, amounting to $47.6 billion, assuming a 12.5 percent royalty rate on the Beaufort leases.

Estimated Federal Government Take from Chukchi OCS Lease Payments (in 2010$)

Total cumulative federal government take from lease revenues in the Chukchi OCS is estimated to amount to $48.7 billion over the 50-year period. Of this total amount, $44.3 billion is estimated to accrue from royalty payments on the Chukchi leases.

4 U.S. Federal Corporate Income Tax Revenues

Table 5 shows the estimated cumulative and annual average federal corporate income tax payments directly generated from the Beaufort and Chukchi OCS development.

Table 5. Estimated Potential Federal Government Take from Corporate Income Tax Payments

Category	Beaufort OCS	Chukchi OCS	Both OCS Areas
		($2010 Millions)	
Cumulative Total : 2008 to 2057	26,684	24,790	51,474
Annual Average	684	689	1,373

Source: NEI estimates, 2010.

These estimates are based on the following data sources and approach:

- The EIA data on offshore petroleum acquisition, exploration, development, and production costs for 2008 (Source data: Financial Reporting System[8] S5211: Refining, Exploration & Production Operations, Expenditures & Operating Expense Detail).
- EIA data on offshore production volumes for oil and gas in 2008 (Source data: Financial Reporting System T-21: Exploration and Development Expenditures, Reserves, and Production by Region).
- 2008 average West Texas Intermediate (WTI) crude oil price and 2008 average Henry Hub natural gas price as reported by the Energy Information Administration.

Net income as a percentage of total revenues was determined using the above data. The costs of exploration, development, and production in the Beaufort and Chukchi OCS areas are anticipated to be double the current costs of operating in the Gulf of Mexico OCS, which is the basis for most of the 2008 EIA data. This higher cost assumption is based on BOEMRE's 2006 analysis of economically recoverable resources in the different OCS areas. Given higher costs in Alaska OCS areas, oil and gas companies' net operating income is estimated to be 20 percent of total revenues.

Using the Beaufort and Chukchi production scenarios and oil and gas price assumptions from the March 2009 study, the amount of taxable income (net operating income) was derived and a 35 percent federal corporate income tax rate was applied.

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[8] The Financial Reporting System (FRS) is designed to permit review of the functional performance of the major U.S. energy-producing companies in total, as well as by specific functions and geographic areas of operation. The financial reporting schedules obtain data on revenues, costs, and profits, thereby indicating financial flows and performance characteristics. In addition, Form EIA-28 collects balance sheet data (i.e., accumulated property, plant, and equipment, etc.), along with data on new investment in these accounts. To complement the financial data, a series of statistical schedules are included to trace physical activity patterns and to evaluate several physical/financial relationships.

5 Federal Personal Income Tax Revenues

Table 6 presents the estimated federal personal income tax receipts associated with the direct, indirect, and induced jobs generated within Alaska. This estimate accounts for the high tax revenues from high wage petroleum workers as it is based on industry-specific wage rates calculated in the original study and 2008 federal average income tax rates (as a share of adjusted gross income) taken from IRS reports. The direct share represents estimated taxes of workers directly engaged in OCS activities. The estimated total payroll associated with the Alaska-based jobs is $63 billion (in 2010$).

Table 7, on the other hand, shows the estimated federal personal income tax payments associated with the direct, indirect, and induced jobs generated outside of Alaska (or the rest of the nation) that result from activities in the Beaufort and Chukchi OCS. This estimate is also based on the 2008 average federal income tax rates. The estimated total payroll associated with the jobs generated outside of Alaska is $82 billion (in 2010$).

Table 6. Estimated Cumulative Federal Personal Income Tax from Activity within Alaska (Millions of 2010$), 2008 to 2057

OCS Area	Direct (basic) Personal Tax Share	Indirect and Induced Personal Tax Share	Total
Beaufort OCS	2,019	1,540	3,558
Chukchi OCS	1,815	1,321	3,136
Total: Both Areas	3,834	2,861	6,694

Source: ISER estimates, 2010.

Table 7. Estimated Cumulative Federal Personal Income Tax from Activity Outside Alaska (Millions of 2010$), 2008 to 2057

OCS Area	Amount
Beaufort OCS	1,930
Chukchi OCS	1,473
Total: Both Areas	3,402

Source: ISER estimates, 2010.

Table 8 presents the combined estimated federal personal income tax payments resulting from activity within Alaska and the rest of the U.S. The estimated combined total payroll associated with OCS jobs within and outside of Alaska is $145 billion.

Table 8. Summary of Estimated Cumulative Federal Personal Income Tax Receipts from OCS Activity within and Outside of Alaska, (Millions of 2010$), 2008 to 2057

OCS Area	Activity Within Alaska	Activity in the Rest the U.S.	Total
Beaufort	3,558	1,930	5,488
Chukchi	3,136	1,473	4,608
Total: Both Areas	**6,694**	**3,402**	**10,096**

Source: ISER estimates, 2010.

6 Additional Federal and State Tax Revenues

Additional federal and state tax revenues arise from corporate income taxes associated with extending the life of the oil pipeline, federal corporate income taxes on indirect effects of OCS activity, federal royalty payments from incremental marginal oil field development in the NPR-A, taxes and revenues from non-petroleum associated business activity, and non-Alaska state sales, personal income, and corporate income taxes.

Additional Revenues from Extending Life of Oil Pipeline

The oil pipeline was assumed to cease operation in 2045 under the No OCS development case in the 2009 study, with remaining North Slope oil transported to market by more expensive tankers. That study also estimated the state production tax, income tax, and royalty revenues that a full or fuller pipeline resulting from OCS production would generate because of a lower tariff (Both higher revenues from existing production and incremental production.) However, if the pipeline were to remain operational beyond 2045, it would also continue to generate property taxes for the State of Alaska, which would be shared with the North Slope Borough and other local governments in which TAPS is located. In addition, the state would capture some revenues through the corporate income tax on the pipeline itself because, as property, the pipeline increases the share of worldwide oil company income to Alaska (compared to an offshore marine transit system). Federal corporate income tax revenues would also be higher because the total return on pipeline operations would be greater than the return on marine transportation because the higher tariff of marine transportation would result in lower oil production.

Table 9. Summary of Estimated Cumulative Property and Income Tax Receipts from Extension of Oil Pipeline Life, (Millions of 2010$), 2008 to 2057

OCS Area	State Property Tax	Local Property Tax	State Income Tax	Federal Income Tax
Beaufort	-	-	-	-
Chukchi	29	264	103	335
Total: Both Areas	**29**	**264**	**103**	**335**

Source: ISER estimates, 2010.

Note: Beaufort Sea OCS production in the March 2009 report was assumed to cease in 2045, the same year as the oil pipeline would cease operating; hence, Beaufort OCS production would not contribute to extending the life of the oil pipeline.

Additional Federal Revenues from OCS Development

The federal government would collect revenues from three additional sources associated with OCS development. The first would be corporate income taxes on the income generated in Alaska from the indirect effects of OCS activity—the reduction of the oil pipeline and gas pipe line tariffs (Value) and the incremental production from marginal oil fields stimulated by the higher wellhead oil price and the additional infrastructure (Volume). This estimated additional federal corporate income tax is determined based on indirect state revenue calculated in the 2009 study.

Table 10. Summary of Estimated Cumulative Federal Corporate Income Tax Receipts from Indirect Revenue Activities, (Millions of 2010$), 2008 to 2057

OCS Area	Value (Full Oil Pipeline)	Volume (Oil Pipeline Life)	Marginal Oil Fields	Expanded Infrastructure	Total
Beaufort	1,608	470	332	277	2,687
Chukchi	1,569	495	276	370	2,710
Both Areas	3,177	965	608	647	5,397

Source: ISER estimates, 2010.

Note: These include increase in taxable income from a lower oil pipeline tariff, the increase in production stimulated by the lower tariff, and the increase in production from reduced costs associated with expansion of petroleum related infrastructure.

The second revenue source would be non-petroleum revenues—other taxes and revenues collected on business activity generated by OCS development—both within and outside Alaska (in addition to the personal income tax). This additional federal revenue is estimated as a share of the personal income tax, based on the ratio of other taxes to the personal income tax revenue collected by the State of Alaska.

Table 11. Summary of Estimated Cumulative Federal Other Taxes and Fees from OCS Activity within and Outside Alaska, (Millions of 2010$), 2008 to 2057

OCS Area	Within Alaska	Outside Alaska	Amount
Beaufort	1,031	559	1,590
Chukchi	887	417	1,304
Total: Both Areas	**1,918**	**976**	**2,894**

Source: ISER estimates, 2010.

The third revenue source would be royalty payments for incremental marginal oil field development in the NPR-A as a result of the Chukchi OCS development and the availability of infrastructure resulting from that development. It is estimated that about $194 million would accrue to the federal government in royalty payments. This assumes a royalty rate of 12.5 percent (for less attractive fields; a royalty rate of 16.67 percent is usually applied to areas that are more attractive). Fifty percent of the royalty payments are retained by the federal government and the remaining payments go to the State of Alaska for addressing impacts on affected communities.

No federal royalty payments are anticipated to accrue from the development of marginal fields due to Beaufort Sea OCS infrastructure since infrastructure already exists or is being planned for areas east of Prudhoe Bay and this is a region of the North Slope that is primarily state-owned.

Non-Alaska State Tax Revenues from OCS Development

Alaska OCS development would generate jobs and expenditures in other states, creating government revenues from personal income tax, sales tax, and other taxes and fees. The magnitude of those revenues is estimated based on anticipated personal income and the national average rates of state income and sales taxes (as a ratio to personal income). The national average rates of state income, sales, and other taxes were obtained from the U.S. Department of Commerce, *State and Local Government Finances*.

Table 12. Summary of Estimated Cumulative Non Alaska State Personal Income and Sales Tax Receipts from OCS Activity, (Millions of 2010$), 2008 to 2057

OCS Area	Amount
Beaufort	3,731
Chukchi	2,847
Total: Both Areas	**6,578**

Source: NEI and ISER estimates, 2010.

7 Sensitivity Analysis

A sensitivity analysis was conducted to consider effects on government take of higher market prices for oil and gas (holding all other factors constant). In this sensitivity analysis, the higher price scenarios do not result in greater volumes of oil and gas production than is presented in the base case analysis.

The base case as presented in the previous sections, assumed long-term (50-year) projected prices of oil and gas fluctuating around $65 per barrel and $6.40 per million Btu of natural gas, respectively. These price assumptions are based on EIA's June 2008 published petroleum price forecast.

This sensitivity analysis considers the following oil and gas price levels through the year 2030:

Case 1: Oil: $80 per barrel and natural gas: $7.80 per mmBtu

Case 2: Oil: $100 per barrel and natural gas: $9.80 per mmBtu

Case 3: Oil: $120 per barrel and natural gas: $11.80 per mmBtu

Market prices after 2030 and through 2057 were assumed to increase at a rate of 0.5 percent per year (same assumption as the base case).

As expected, higher market prices for oil and gas would result in higher government revenues from oil and gas development in Alaska's OCS areas.

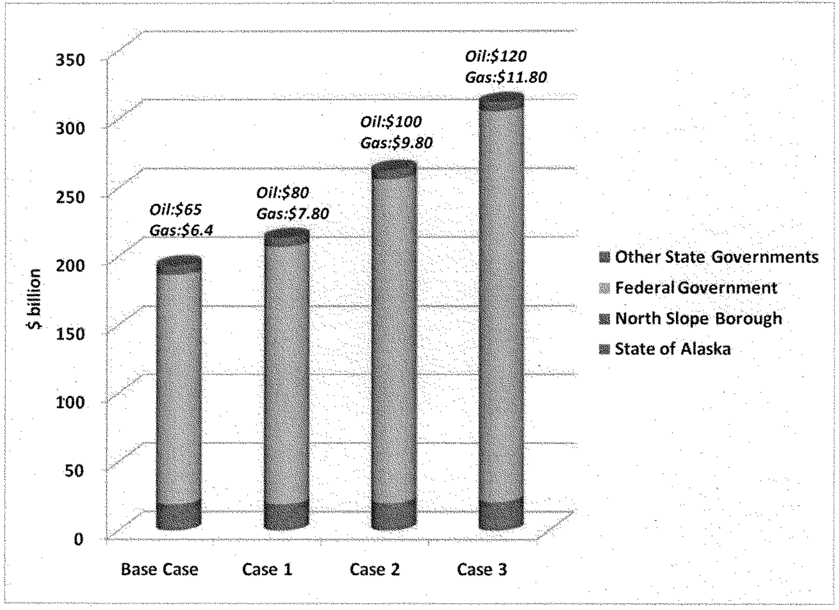
The results of the sensitivity analysis are summarized in the following figures. Figure 1 presents the estimated government take by entity under different petroleum price levels. Figure 2 illustrates the sensitivity of various estimated government revenues to changes in market prices for oil and gas. This figure only includes those revenue categories (federal and state) that are anticipated to be affected by changes in oil and gas prices.

In particular, the sensitivity analysis indicated the following:

- Total government take (federal, state, and local) increases from $193 billion under the base case to $214 billion under Case 1, $263 billion under Case 2, and $312 billion under Case 3 (See Figure 1).
- Of the various direct and indirect revenue streams, the most sensitive to higher oil and gas price levels is federal government take from lease revenues (see Figure 2). In the base case, estimated total cumulative lease revenues accruing to the federal government from the Beaufort and Chukchi OCS development is $97 billion. Higher prices are expected to result in $110 billion under Case 1 price level, $140 billion under Case 2 price level, and $171 billion under Case 3 price level.
- Federal corporate income taxes also increase with higher price levels. Base case estimated cumulative federal corporate income tax payment from the Beaufort and Chukchi OCS development is $52 billion (See Figure 2). Under Case 1 price level, government take is estimated to increase to $59 billion, $76 billion under Case 2, and $93 billion under Case 3.
- With higher prices, indirect revenues to the State of Alaska increase as a result of higher oil and gas wellhead values on the new production considered in the base case—new production from lower tariff and new production from expanded infrastructure. Higher wellhead prices result in higher royalties, production, and income tax payments from the oil and gas industry (see Table 13).
- Higher prices do not have any significant effect on indirect revenues associated with the full pipeline effects (oil and gas pipelines) since those revenue effects are quantified based on the

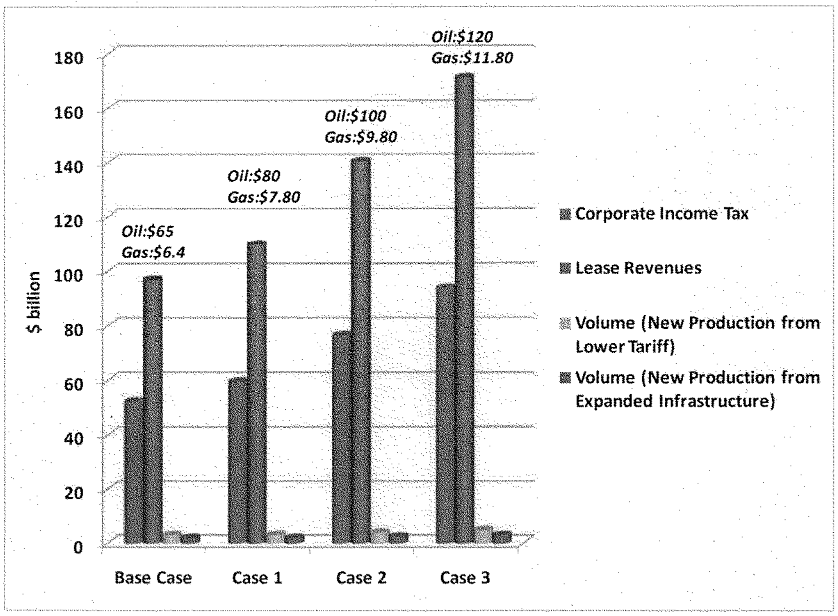
impact of additional throughput on pipeline tariffs (the difference in the pipeline tariff due to additional throughput does not change with higher petroleum market prices). Similarly, indirect effects associated with the extended life of TAPS are not affected by changes in prices since higher price scenarios do not result in greater volumes of oil and gas production.

Figure 1. Estimated Cumulative Government Take by Entity under Different Petroleum Price Levels, Combined Beaufort and Chukchi OCS Development (in 2010$)



Source: NEI and ISER estimates, 2010.

Figure 2. Estimated Cumulative Federal and State Government Take by Revenue Stream under Different Petroleum Price Levels, Combined Beaufort and Chukchi OCS Development (in 2010$)



Source: NEI and ISER estimates, 2010.

Table 13 summarizes the results of the sensitivity analysis by revenue category under the different price level assumptions. As shown in the table, estimated government take from property taxes, non-petroleum taxes, and indirect revenues from full oil pipeline effect, extended life of oil pipeline effect, and full gas pipeline effect are not significantly affected by changes in market prices and remain unchanged from base case estimates. On the other hand, estimated government take from corporate income tax receipts, lease revenues, and indirect revenues from new production due to lower tariff and expanded infrastructure increases with higher market prices for oil and gas.

Table 13. Estimated Cumulative Federal, State, and Local Government Take under Various Price Levels by Category and by Entity, Combined Beaufort and Chukchi OCS Development (in 2010$ millions)

Category	Base Case $65/barrel $6.4/mmBtu	Case 1 $80/barrel $7.8/mmBtu	Case 2 $100/barrel $9.8/mmBtu	Case 3 $120/barrel $11.8/mmBtu
Direct Revenues				
Property Tax	3,950	3,950	3,950	3,950
Corporate Income Tax	52,320	59,595	76,759	93,923
Lease Revenues	96,887	109,876	140,525	171,175
Non-Petroleum Revenues				
Personal Income Tax	12,648	12,648	12,648	12,648
Potential Income Tax	2,794	2,794	2,794	2,794
Other Taxes and Fees	7,721	7,721	7,721	7,721
Indirect Revenues				
Value (Full Oil Pipeline)	9,230	9,230	9,230	9,230
Value (Extend Life of Oil Pipeline)	731	731	731	731
Volume (New Production from Lower Tariff)	3,064	3,144	4,019	4,893
Volume (New Production from Expanded Infrastructure)	1,930	1,980	2,532	3,082
Value (Full Gasline)	1,881	1,881	1,881	1,881
Total:	**193,156**	**213,550**	**262,790**	**312,028**

Source: NEI and ISER estimates, 2010.

8 Estimated Jobs Generated in the Rest of the Nation (Outside Alaska)

Potential employment effects of OCS development on the rest of the nation were generated using Policy Insight+ (PI+). This model, which is similar to ISER's MAP model for Alaska, is a dynamic forecasting and policy analysis model that integrates input-output, computable general equilibrium, econometric, and economic geography methodologies. PI+ was developed by Regional Economic Models, Inc. (REMI) and is widely used by government agencies (including most U.S. state governments), private and public research firms, and utilities.

The analysis considered the effects of an increase in economic activity associated with exploration, development, and production of OCS oil and gas resources. The inputs to the PI+ model were the estimated annual direct jobs associated with 28 different OCS activities starting from geological survey all the way to abandonment. These direct job estimates are based on previous manpower requirements results generated in the March 2009 study. The results only go through 2050, a constraint of the PI+ model.

Table 14. Estimated Annual Average Employment Effects of the Beaufort and Chukchi OCS Development on the Rest of the United States

Category	Beaufort OCS	Chukchi OCS	Both OCS Areas
Annualized Average			
Entire Timeframe	16,400	12,100	28,500
Production Phase	20,300	15,200	35,500
Peak Employment	32,800	20,800	
Year of Peak Employment	2027	2038	

Source: REMI's PI+ model results using direct job estimates from 2009 NEI and ISER study.

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UA
Understanding Alaska

WHAT DRIVES THE ALASKA ECONOMY?

By Scott Goldsmith

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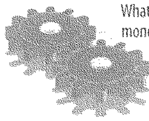


What drives Alaska's economy is new money: money coming in from outside the state. How big the economy is, and how much it grows, depends on how much new money comes in.

New money comes from "basic" sectors—the sectors that are the basis for all jobs and income across Alaska. They are, in effect, the gears driving the economy.

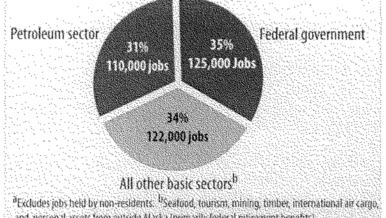
Alaska has eight main basic sectors, but the number of Alaskans they employ directly is small, compared with the number of jobs they support indirectly. Figure 1 shows numbers and shares of jobs for Alaskans that the federal government, the petroleum sector, and the other basic sectors generated on average between 2004 and 2006. The numbers for any specific period aren't as important as the percentages, which don't change much from year to year.

- *If the flow of federal and petroleum money disappeared overnight, two-thirds of the jobs for Alaskans would also disappear*, because each of them supports a third of those jobs.
- *Alaska's other basic sectors combined support about a third of jobs for Alaskans.* The seafood, mining, and timber sectors produce commodities that are exported. The tourism and international air cargo sectors sell services to people from outside Alaska. Federal retirement checks and investment income Alaskans collect from outside sources also generate jobs.

How is it that the federal government and the petroleum sector support most jobs for residents, and several other sectors support the rest? This summary, based on a longer paper (see back page), is a unique analysis of how the basic sectors drive the economy. Instead of looking just at jobs in a specific activity—seafood processing, for instance—we allocate all the jobs throughout the economy to the basic sectors that support them. This method gives a clearer picture of the structure of the economy, but it may produce different numbers than other methods.

Here we use jobs for residents to measure economic contributions—a reasonable measure but not the only one, as we discuss in the full paper.

Figure1. What Generates Jobs for Alaska Residents[a]?
(Annual Average Number of Jobs for Residents, 2004-2006: 357,000)



[a]Excludes jobs held by non-residents. [b]Seafood, tourism, mining, timber, international air cargo, and personal assets from outside Alaska (primarily federal retirement benefits).

Note: This analysis shows that the petroleum sector reaches across Alaska's economy, supporting jobs in almost every industry. But petroleum's effects go even deeper, as a follow-up ISER study will show. Without the support and stability petroleum has provided since the 1960s, Alaska's economy might be only half the size it is today. Look for the new study in early 2009.

We analyze just jobs for Alaska residents, even though many non-residents also work here. They don't typically spend their paychecks in Alaska, so they don't add as much to the economy.

To compare across sectors, we've converted all jobs to an annual average number. That means for industries like commercial fishing and tourism, which have a lot of seasonal jobs, we've translated the larger number of seasonal jobs into a smaller number of year-round jobs. Still, keep in mind that not all jobs are equal; some pay much more than others.

WHY DOES ALASKA'S ECONOMY LOOK LIKE THIS?

Before we talk more about how the basic sectors generate jobs, it's useful to look at the big picture. Why does the federal government play such a big role in Alaska, and why are most basic sectors ones that produce natural resources? Why don't we have, say, more in-state manufacturing or large high-tech businesses?

Federal spending in Alaska is high, relative to the population, for several reasons—including a large military presence; huge federal land holdings; federal health-care and other programs for Alaska Natives; and continuing construction of basic infrastructure that the federal government helps pay for.

Alaska's economy has also historically been shaped by characteristics that increase the costs of doing business and make development difficult—including huge size, harsh climate, and distance from markets and suppliers. Economic growth and technological advances have reduced but not eliminated such disadvantages, especially in remote areas.

WHY IS NEW MONEY IMPORTANT?

Why is it important for new money to come into the state? That's because no economy—in Alaska or anywhere—is self-sufficient. All economies have to buy goods and services that aren't produced locally, which means money flows out of the local economy to economies somewhere else. That loss has to be offset by new money flowing in, or the local economy would eventually go broke.

This summary is part of a new ISER initiative, *Investing for Alaska's Future*, underwritten by a grant from Northrim Bank and in partnership with the University of Alaska Foundation. Go to www.iser.uaa.alaska.edu for more information.

How Basic Industries Work

The new money every economy needs comes from selling goods or services to companies or people from somewhere else. Several of Alaska's basic sectors produce commodities for export to world markets—oil and gas, seafood, minerals, and timber. The tourism and air cargo sectors provide services to consumers from outside Alaska —visitors from other places who spend money in the state, and international cargo carriers that spend money locally for refueling and other services.

Money also arrives via the mailboxes of retirees, who collect Social Security, federal retirement benefits, and pensions. Other Alaskans also collect earnings from investments outside the state. The federal government doesn't produce commodities or services for sale in the market, but it's a basic sector because all federal money coming into Alaska is new money.

Keep in mind that the number of Alaskans the basic sectors employ directly is only a small fraction of the total jobs they generate. The best example of small direct employment but huge indirect employment is in the petroleum sector. Only about 5,000 Alaskans work directly in producing oil and gas, but the petroleum sector supports more than 100,000 jobs.

The oil companies spend a lot of money hiring other businesses to work for them, and they pay good wages. They also pay billions of dollars in taxes and royalties to the state government. In these and other ways, the petroleum sector supports jobs in almost all Alaska's industries. As Figure 2 shows, the petroleum sector supports 75% of state government jobs and more than half of local government jobs. A quarter to a third of all jobs in finance, utilities, retail and wholesale trade, and construction can be traced in some way to the petroleum sector.

For two of Alaska's basic sectors—tourism and retirement income—it's impossible to identify any specific direct jobs, because tourists and retirees spend their money at the same businesses where all Alaskans do. But these sectors nonetheless indirectly support thousands of jobs .

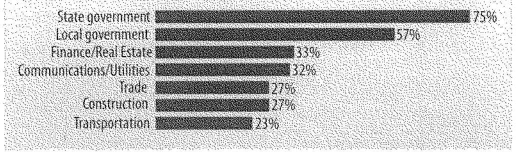
Non-Basic Sectors: Serving Alaskans

Besides the basic sectors, there are other parts of the economy that don't sell anything to people from outside Alaska but instead provide goods and services for Alaska households and businesses. These non-basic sectors depend on money generated by the basic sectors— but they are also essential to the economy, because they circulate money inside Alaska.

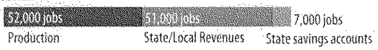
Money from the basic sectors circulates through the economy as households and businesses make local purchases—and as the money circulates, it generates additional jobs and income. That's known as the multiplier effect. The larger the non-basic sectors are, the more times the money turns over in the economy and the bigger the multiplier effect.

A big change in the Alaska economy since statehood has been the growth of industries providing local goods and services. As recently as the 1960s, Alaskans couldn't buy a lot of things locally, and they often traveled Outside for specialized medical care and other services. But in Alaska's urban areas the non-basic sectors now provide virtually the same goods and services found nationwide, and Alaska businesses are also able to get support services locally. Because the non-basic sectors are larger now, more money stays in the local economy longer.

Figure 2. What Shares of Jobs in Various Industries Depend on Petroleum?



Petroleum Industry



About 17% of U.S. oil production is from Alaska, and petroleum is the state's most important natural resource sector. Oil production is concentrated on the North Slope, with a small amount from Cook Inlet, which also produces natural gas. The petroleum industry creates jobs directly and indirectly through production; through revenues for state and local governments; and through special state savings accounts created with oil revenues. (A number of other studies, including a 2008 study by the Alaska Oil and Gas Association, have estimated the economic importance of petroleum. But because those studies use different methods, the results differ somewhat.)

- *Only a small share of the 52,000 jobs for Alaskans that depend on petroleum production are direct production jobs.* Petroleum production, exploration, and development activities also create jobs in oil-field support, construction, and other industries. The trans-Alaska pipeline, which carries North Slope oil to the port at Valdez, generates jobs in transportation and other industries. In-state oil refineries create jobs in manufacturing, transportation, and other industries. Jobs in many other Alaska businesses also depend on spending by households and businesses with income related to petroleum production.

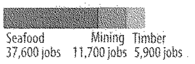
- *State and local petroleum revenues support about 50,000 jobs for Alaskans.* That includes roughly 30,000 state and local government jobs and 20,000 private jobs generated by state and local spending of oil revenues. Petroleum revenues essentially finance the entire state General Fund operating budget, and about 40% of local government revenues come either through local taxes on petroleum property or state aid. No other state depends so much on a single sector to support state and local activities.

- *Permanent Fund dividends and the Constitutional Budget Reserve also support about 7,000 jobs for Alaskans.* These jobs are indirectly generated by the petroleum industry, because the state's big savings accounts—the Permanent Fund and the Constitutional Budget Reserve—were established with petroleum revenues.

The Permanent Fund is a multi-billion-dollar savings account. The state constitution prohibits spending the principal of the Permanent Fund, but every year since the early 1980s the legislature has used a share of the fund's earnings to make payments to all Alaska residents. When Alaskans spend these dividends, they generate private jobs throughout the economy.

The Constitutional Budget Reserve was established as a savings account to be used when the state faces budget deficits—as it did several times in the 1990s, when oil prices and state oil revenues were low. Spending from this reserve generates jobs in the same way as other state spending of petroleum revenues.

Traditional Resources Industries



Alaska's traditional resource industries—which supported the private economy before oil was discovered—are the seafood, mining, and timber industries. Alaska's first salmon cannery opened in 1878, and the Gold Rush brought mining to Alaska toward the end of the 1800s. Large-scale timber harvesting began in the 1950s.

These resource industries remain important to the economy, but their contributions are often obscured by the prominence of the petroleum industry. Alaska is among the world's top seafood producers; only eight countries produce more wild seafood. The value of minerals from Alaska—especially zinc—climbed in recent years, as metal prices rose. The timber industry has shrunk since the 1990s.

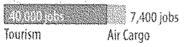
- *The seafood industry supports almost 38,000 jobs for Alaskans,* on an annual average basis. Besides direct fishing and processing jobs, this includes jobs in boat repair, fuel supply, and air transportation, as well as jobs in stores, banks, and other businesses where Alaska households and businesses spend their income from seafood.

- *Mining supports nearly 12,000 jobs for Alaskans,* including about 2,500 direct jobs in production, exploration, and development, as well as a number of self-employed miners. Mining indirectly supports jobs in businesses that sell supplies to the mines and in construction companies working on mine development. Alaska Native corporations own land where several producing or planned mines are located—and royalties they receive from mining companies indirectly support some Native corporation jobs.

- *Alaska's timber industry supports about 6,000 jobs.* Timber was a big part of Southeast Alaska's economy from the 1950s to the 1980s. But it shrank as the federal government reduced the timber supply from the Tongass National Forest, as harvests on Alaska Native corporation lands declined, and as world markets became more competitive.

- *Alaska's small agriculture industry* produces mostly for local markets. The fur industry, which was important historically, is also small today.

Newer Basic Industries



Two of Alaska's basic industries have developed largely since Alaska became a state: the tourism and international air cargo industries. Tourism has been increasing since the 1960s, but the number of tourists has grown sharply in more recent times. Between 1990 and 2006 the number of tourists visiting Alaska in the summer more than doubled—from under 700 thousand to about 1.6 million.

Almost all the international cargo activity is at Anchorage's Ted Stevens International Airport, ranked third worldwide for volume of cargo handled in 2006. For decades, air carriers flying between the U.S. and the Far East have stopped to refuel, change crews, and do routine maintenance. Many jets now have a range that would allow them to overfly Alaska, but most carriers still find it economical to carry a heavier payload and less fuel.

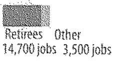
Three major carriers have also now established package-sorting facilities at Anchorage's airport, and a number of carriers move cargo between planes to consolidate shipments for different destinations.

- *Tourism supports about 40,000 jobs for Alaskans,* on an annual average basis. Perhaps half of these jobs are in restaurants, hotels, lodges, bars, sightseeing businesses, and other establishments that provide services to tourists. Additional jobs are indirectly generated when Alaska households and businesses spend their tourism-related income in the economy.

This estimate of jobs generated by tourism is calculated indirectly. That's because Alaskans also spend their money at the same businesses where tourists do—making it impossible to associate particular jobs with spending by tourists. Instead, we use available information on tourist spending and other factors to estimate jobs generated.

- *International air cargo activities at Anchorage's airport directly generate an estimated 3,500 jobs for Alaskans,* including cargo handlers, couriers, cargo pilots who live in Anchorage, and others involved in cargo activities. Those activities also indirectly support about 4,000 more jobs in other industries. Virtually all these jobs are in Anchorage.

Personal Assets



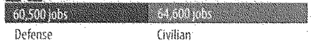
Another source of money flowing into the state is one Alaskans don't typically think of: personal assets. These are mainly retirement checks (sometimes called the "mailbox economy") for older Alaskans, as well as health-care spending for older people through Medicare, Medicaid, and private insurance. It also includes Alaskans' investment income from Outside.

Like tourists, retired Alaskans spend their money at the same stores, restaurants, and other businesses as all Alaskans do. That makes it impossible to associate particular jobs with spending by retirees. Our estimate of jobs generated by retirement income is calculated indirectly, based on the limited information about retirees in Alaska.

- *Retirement checks and health-care spending for older Alaskans generate nearly 15,000 jobs for residents.* Income from investments outside the state and other non-earned income flowing into Alaska generate about 3,500 more jobs.

- *Spending by older Alaskans is a growing source of jobs in the state.* Until recently, few people stayed in Alaska when they retired. But the number of Alaskans 65 and older quadrupled between 1980 and 2007, growing to 47,000—and that number is expected to reach 134,000 by 2030.

Federal Government



The federal government supports more jobs for Alaskans than any private industry—including even the petroleum industry. Just over a third of Alaskans with jobs depend in some way on federal spending.

Federal spending in Alaska generates jobs in many ways and through both military and civilian activities. A lot of federal money flows into Alaska, relative to the number of Alaskans—an estimated $9.25 billion in 2006, for a population of around 670,000. At the beginning of this summary we touched on some of the reasons why. Those include a large military presence, big federal land ownership, health and other programs for Alaska Natives, and the continuing need to build basic infrastructure in much of Alaska.

HOW DO SPECIAL CHARACTERISTICS SHAPE THE ALASKA ECONOMY?

Alaska is a long way from markets and suppliers; it's huge and 90% has no roads; it has severe winters and a lot of permafrost.

- Resource development is difficult and very expensive. Even rich resources (like North Slope natural gas) face big economic barriers.
- The costs of doing business are high, especially in remote areas. It's very hard to start new businesses or maintain existing ones.

The population is small—only three states have fewer people—and the people and the jobs are concentrated in relatively small areas.

- Only a few urban areas are large enough to benefit from economies of scale and support year-round businesses providing local services.
- Hundreds of remote communities are accessible only by air or water, have few jobs, and depend heavily on subsistence hunting and fishing.

Alaska has the highest seasonal variation in jobs nationwide. The number of private jobs is about 25% higher in summer.

- Communities that depend heavily on seasonal jobs in seafood and tourism have trouble supporting year-round local businesses.

Non-residents hold nearly one quarter of Alaska's private jobs. Many but not all these jobs are in industries that ramp up in summer.

- There aren't enough residents with the necessary technical skills to fill all the jobs in petroleum production and other non-seasonal industries.

No other state depends on a single, non-renewable resource as much as Alaska depends on oil production—which is declining.

- Oil revenues make up most of the state's general income and about 40% of local government revenues (largely through state aid).

Most resource development is in enclaves, in remote locations without an adequate skilled local labor supply or local support services.

- Developers supply their own workers and services, so regional economies get limited benefit from such jobs and business activity.

The resource industries that drive Alaska's economy are dominated by large national or international companies.

- That's partly because it requires so much money to develop and produce Alaska's resources, especially petroleum and minerals.

The federal and state governments together own 89% of Alaska land, compared with 35% nationwide.

- This limits potential local property tax bases, but offers opportunities (like state-owned oil fields) for revenues from resource development.

Nearly one-quarter of Alaska jobs are in government—compared with a U.S. average of 13%—largely because of federal jobs.

- Having so many public jobs makes Alaska's economy somewhat more stable in the face of changing market conditions.

- *About 11,000 Alaskans work for civilian federal agencies and another 53,000 Alaskans indirectly depend* on civilian activities for their jobs. Federal grants to state and local governments for operations and capital projects, to Alaska Native non-profit corporations, and to other non-profits generate some of those indirect jobs. Other jobs are generated by payments to individuals (excluding the retirement income discussed earlier) and spending for food stamps, unemployment insurance, and other programs. These flows of federal dollars generate more jobs throughout the economy. For example, federal employees generate jobs when they spend their wages, and federal agencies create jobs when they buy from local businesses.
- *More than 22,000 direct military jobs and 6,000 civilian jobs in the Department of Defense are in Alaska, and military activities generate another 32,000 jobs around the state.* Those jobs are generated in many ways—for instance, when military personnel spend their wages; when the military hires construction companies to build facilities or contracts with local businesses to provide various services; or when the military buys from local businesses.

CONCLUSIONS

As Alaska celebrates 50 years as a state, the size and structure of its economy is dramatically different from what it once was. A mix of basic sectors—public and private, large and small—combine to drive the economy. The federal government and the petroleum sector dominate the picture: the health of the economy really depends on their health, even though the number of Alaskans they employ directly is small, compared with their big indirect contributions.

Basic sectors that traditionally supported the economy—particularly seafood and mining—still make important contributions. Other sectors, especially tourism, have grown significantly since statehood. A growing number of retirees also contribute to Alaska's well-being. (Here we used jobs as a measure of contributions, but as the full report discusses, there are other measures—payroll, income, sales, and gross state product.)

The contributions each sector makes depend on its specific characteristics, but the most important factors are purchases from other Alaska businesses and payroll generated for Alaska households. As the economy has grown, the basic sectors have been able to rely more on purchases from local Alaska businesses, and their employees have been able to find more goods and services provided locally. This expansion of businesses serving the local economy enhances the contribution of the basic sectors.

The snapshot of the Alaska economy provided here is the first step in understanding how Alaska's economy has changed over the past 50 years. We need to understand these changes, so we can continue to have a strong and resilient economy in the decades to come. The next paper in this series will look in more depth at how the petroleum sector has provided the resources and stability behind Alaska's economic transformation.

This summary is based on a report by Scott Goldsmith, *Structural Analysis of the Alaska Economy: What are the Drivers?* It's the first in a series of reports in the new ISER program, *Investing for Alaska's Future*. That program is studying the importance of investing for Alaska's future. But to plan for the future, Alaskans need to understand how their economy works. The program is underwritten by a grant from Northrim Bank, in partnership with the University of Alaska Foundation.

To see the full report and to learn more about the research program, go to:

www.iser.uaa.alaska.edu

Editor: Linda Leask Graphics: Clemencia Merrill

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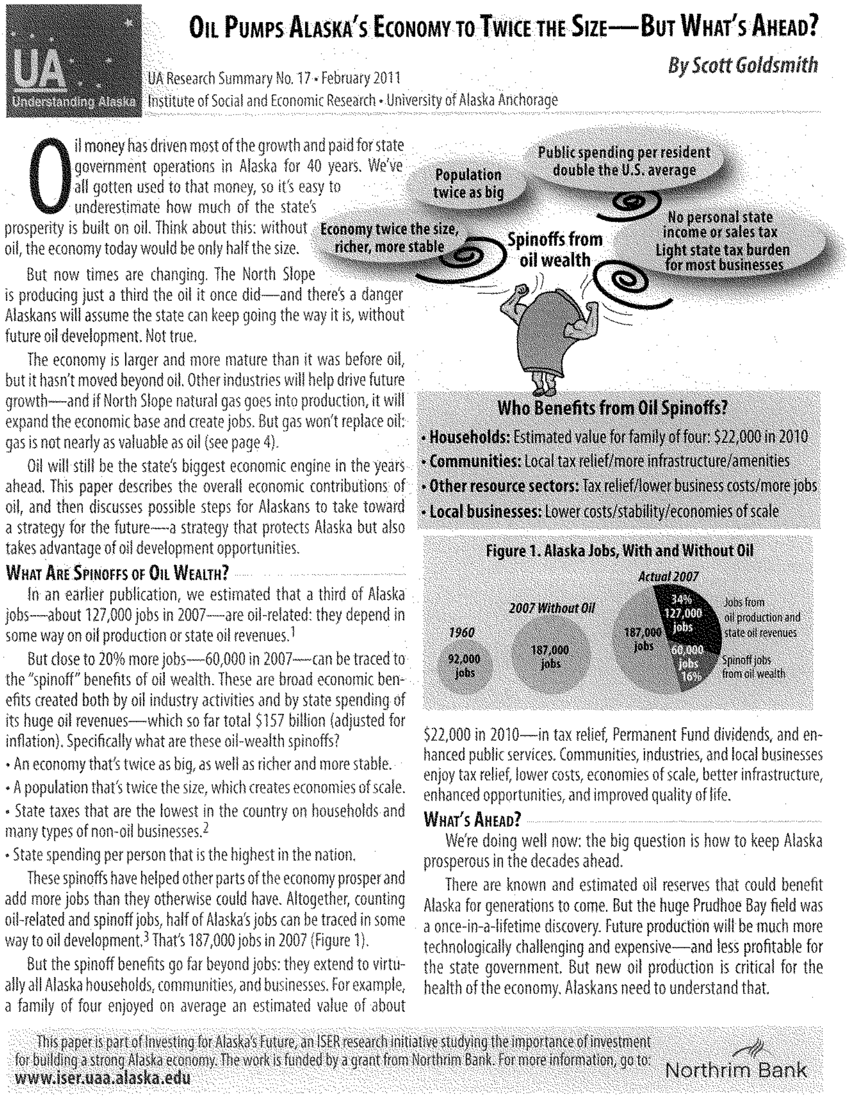

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Institute of Social and Economic Research • University of Alaska Anchorage

OIL PUMPS ALASKA'S ECONOMY TO TWICE THE SIZE—BUT WHAT'S AHEAD?

By Scott Goldsmith

Oil money has driven most of the growth and paid for state government operations in Alaska for 40 years. We've all gotten used to that money, so it's easy to underestimate how much of the state's prosperity is built on oil. Think about this: without oil, the economy today would be only half the size.

But now times are changing. The North Slope is producing just a third the oil it once did—and there's a danger Alaskans will assume the state can keep going the way it is, without future oil development. Not true.

The economy is larger and more mature than it was before oil, but it hasn't moved beyond oil. Other industries will help drive future growth—and if North Slope natural gas goes into production, it will expand the economic base and create jobs. But gas won't replace oil: gas is not nearly as valuable as oil (see page 4).

Oil will still be the state's biggest economic engine in the years ahead. This paper describes the overall economic contributions of oil, and then discusses possible steps for Alaskans to take toward a strategy for the future—a strategy that protects Alaska but also takes advantage of oil development opportunities.

WHAT ARE SPINOFFS OF OIL WEALTH?

In an earlier publication, we estimated that a third of Alaska jobs—about 127,000 jobs in 2007—are oil-related: they depend in some way on oil production or state oil revenues.[1]

But close to 20% more jobs—60,000 in 2007—can be traced to the "spinoff" benefits of oil wealth. These are broad economic benefits created both by oil industry activities and by state spending of its huge oil revenues—which so far total $157 billion (adjusted for inflation). Specifically what are these oil-wealth spinoffs?

- An economy that's twice as big, as well as richer and more stable.
- A population that's twice the size, which creates economies of scale.
- State taxes that are the lowest in the country on households and many types of non-oil businesses.[2]
- State spending per person that is the highest in the nation.

These spinoffs have helped other parts of the economy prosper and add more jobs than they otherwise could have. Altogether, counting oil-related and spinoff jobs, half of Alaska's jobs can be traced in some way to oil development.[3] That's 187,000 jobs in 2007 (Figure 1).

But the spinoff benefits go far beyond jobs: they extend to virtually all Alaska households, communities, and businesses. For example, a family of four enjoyed on average an estimated value of about $22,000 in 2010—in tax relief, Permanent Fund dividends, and enhanced public services. Communities, industries, and local businesses enjoy tax relief, lower costs, economies of scale, better infrastructure, enhanced opportunities, and improved quality of life.

Population twice as big
Public spending per resident double the U.S. average
Economy twice the size, richer, more stable
Spinoffs from oil wealth
No personal state income or sales tax
Light state tax burden for most businesses

Who Benefits from Oil Spinoffs?

- **Households:** Estimated value for family of four: $22,000 in 2010
- **Communities:** Local tax relief/more infrastructure/amenities
- **Other resource sectors:** Tax relief/lower business costs/more jobs
- **Local businesses:** Lower costs/stability/economies of scale

Figure 1. Alaska Jobs, With and Without Oil

WHAT'S AHEAD?

We're doing well now: the big question is how to keep Alaska prosperous in the decades ahead.

There are known and estimated oil reserves that could benefit Alaska for generations to come. But the huge Prudhoe Bay field was a once-in-a-lifetime discovery. Future production will be much more technologically challenging and expensive—and less profitable for the state government. But new oil production is critical for the health of the economy. Alaskans need to understand that.

This paper is part of Investing for Alaska's Future, an ISER research initiative studying the importance of investment for building a strong Alaska economy. The work is funded by a grant from Northrim Bank. For more information, go to: **www.iser.uaa.alaska.edu**
Northrim Bank

Background

When Alaska became a state, in 1959, the cash economy was very small and depended mostly on federal activities and seasonal salmon fisheries. Oil from Cook Inlet provided a boost in the 1960s. Then, in 1968, oil companies discovered the largest field ever found in North America—the Prudhoe Bay field on Alaska's North Slope.

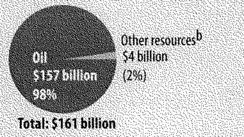
North Slope production started in 1977, when the trans-Alaska oil pipeline was completed. Prudhoe Bay was initially estimated to hold 9 billion barrels of recoverable oil, but by 1997 it had produced more than that. At the peak of North Slope production in 1988, Prudhoe Bay and smaller fields, mostly Kuparuk, produced 2 million barrels a day—which at the time was 16% of U.S. and 2% of world production.

Prudhoe Bay was a once-in-a-lifetime discovery. It and other North Slope fields have been an enormous boon to Alaska because (1) the oil was so plentiful; (2) it was cheap to produce; and (3) it was on land the state government owns—meaning the state has collected much larger revenues than it otherwise would have.

So far Alaska has produced 17 billion barrels of oil—which make up 80% of the value of all Alaska resource production since 1959 but 98% of the $161 billion in resource revenues the state government has collected (Figure 2). Prudhoe Bay has been the big source, but smaller fields on the North Slope and in Cook Inlet also contributed.

Figure 2. State Revenues from Natural Resources[a]

(Cumulative Revenues, 1959-2010, in 2010 Dollars)



[a] Includes General Fund, Permanent Fund, and Constitutional Budget Reserve revenues.

[b] Seafood, mining, and timber taxes and royalties and a portion of state corporate income tax.

Then and Now

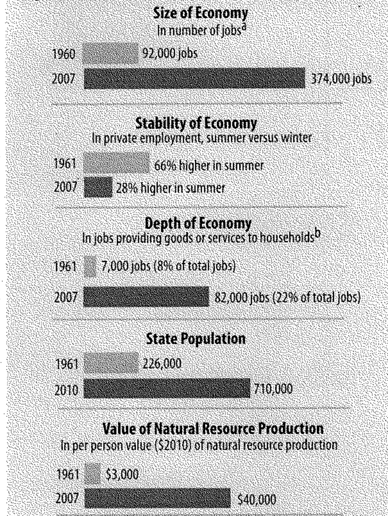
Figure 3 shows the difference oil has made. It compares Alaska's economy, population, and resource production value now and in 1961.

- *Size of economy*. Alaska had 92,000 jobs in 1961. By 2007 it had four times as many—about 374,000. That includes military jobs, wage and salary jobs, and an estimate of self-employed Alaskans.
- *Stability of economy*. In 1961, summer jobs in fishing and construction made up a big share of Alaska's private jobs, and private employment was 66% higher in the summer. But many jobs created since then are year-round, making Alaska's economy much more stable.

Still, the fishing industry remains one of Alaska's largest private employers, and summer jobs in tourism have multiplied since the 1960s. So the economy continues to be more seasonal than economies in other states, with private employment 28% higher in summer. But as Figure 4 shows, tens of thousands of year-round jobs generated by oil production and oil revenues have created much more stability.

- *Depth of economy*. One measure of the depth of an economy is how many local businesses it can support, providing goods and services for residents and other businesses. Alaskans in the 1950s sometimes joked that getting a haircut required flying to Seattle: the thin, seasonal economy just couldn't support many year-round local businesses. In 1961, there were about 7,000 jobs in such businesses, making up 8% of Alaska's 90,000 jobs. By 2007, there were about 82,000 jobs in businesses providing goods and services for households, and those jobs made up 22%—nearly one in four—of Alaska's 374,000 jobs.

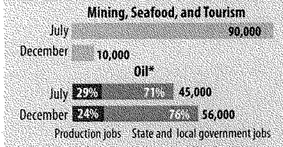
Figure 3. Alaska's Economy and Population Then and Now



[a] Includes active-duty military, nonagricultural wage and salary jobs, and estimated full-time equivalent jobs among the self-employed.

[b] Jobs in trade, health care, and other service industries.

Figure 4. Seasonality of Direct Jobs, 2007



*Includes shares of government jobs supported by oil revenues.

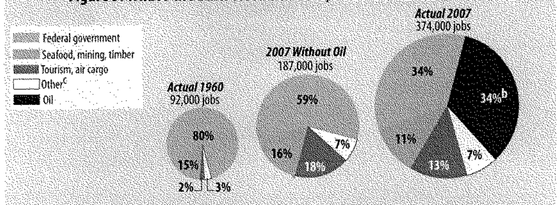
- *Size of population*. Alaska's population is now triple what it was in 1960, up from 226,000 to 710,000 in 2010. Alaska can support a population that large because oil has generated so many jobs.
- *Value of resource production*. Alaska's economy is based largely on natural resources, so a good measure of the state's wealth is the value of resource production. In 1961, that value—from seafood, mineral, and timber production—was about $3,000 per person (in today's dollars), for Alaska's 226,000 residents. In 2007, with oil in the resource base, the value of resource production was $40,000 per person—ten times as much, even though there were three times as many residents.

WITHOUT OIL

On page 1 we introduced the idea of how much smaller Alaska's economy might be without oil. Figure 5 provides more detail on the size of and basis for the economy, with and without oil.

It's impossible to know exactly what would have happened, without oil. But using what seem like reasonable assumptions, we estimated how the number of Alaska jobs in 2007, and the basis for those jobs, might have been different, without oil development.

Figure 5. What's the Basis for Alaska Jobs, With and Without Oil?[a]



[a] These are the state's economic drivers, which generate growth by bringing money in from outside Alaska; they are the basis for all Alaska jobs.
[b] Jobs generated by oil production and state and local oil revenues; spinoff jobs from oil wealth are shared among other economic drivers.
[c] Mostly retirement income and miscellaneous manufacturing.

The basis for the economy—for all the jobs—is new money from outside Alaska. We call the sectors that bring money in the *economic drivers*. How much the economy grows depends on how much money those drivers bring in, and how long the money circulates before leaking out of the economy. Without oil, there would have been a whole lot less money coming in.

In 1960, Alaska had 92,000 jobs; the first pie in Figure 5 shows how many jobs each economic driver supported. The other pies show two views of 2007—the actual number and basis of jobs in 2007, and what might have been, without oil. What's the difference?

- *Without oil, the state would have about half as many jobs as it does today*, and the federal government would still support the majority. The economy would be bigger than in 1960, but structurally similar.
- *The biggest changes without oil would likely have been big growth in tourism*, expansion of the seafood and mining industries, and development of the air cargo industry.
- *Alaska's economy would have remained very seasonal.* Seafood and tourism—the two private industries generating the most jobs, in the absence of oil—are active mostly in the summer.
- *Alaska households and businesses wouldn't have benefited from state government oil revenues*—so far, $157 billion (in today's dollars).

SPINOFFS OF OIL WEALTH

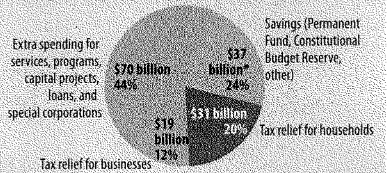
About a third of Alaska jobs are related to oil production, state and local oil revenues, and individual Alaskans spending their state Permanent Fund dividends.[4]

Beyond those oil-related jobs are more jobs that can be traced to the transformative effects oil has had on the economy, people, and government—the spinoff effects of oil wealth: a bigger, richer, more stable economy; high public spending coupled with low state taxes for households and most non-oil businesses; and a bigger population.

By reducing the costs of doing business and improving economic opportunities, these spinoffs have helped other economic sectors prosper and create about 60,000 jobs, or one in five Alaska jobs.

But as we said earlier, the benefits of oil wealth go far beyond jobs to reach Alaska households, businesses, and communities. Partly these benefits are from oil industry activities, but many are the result of how the state has used its oil revenues. Figure 6 shows what the state did with the $157 billion (in today's dollars) it has collected so far.

Figure 6. What Did the State Do with $157 Billion of Oil Money?
(Cumulative Oil Revenues, 1959-2010, in 2010 Dollars)



*This is not the total balance of these accounts in 2010. It includes only the actual oil revenues deposited over time and excludes earnings that have been re-deposited.

HOW HAS THE STATE USED ITS OIL MONEY?

- *Extra spending for services and unique programs*. About 44%—$70 billion—of oil revenues went for, among many other things, new and expanded operating programs; construction of schools, community facilities, and other infrastructure; loans to students, fishermen, and others; and aid to municipalities and schools. Some revenues funded the start-up of special corporations that make home mortgage loans and promote economic development. Most famously, in 1982 the state began sending annual checks (Permanent Fund dividends) to every resident, from the earnings of the Permanent Fund.
- *Tax relief*. Almost a third of oil revenues—$50 billion—went to keeping state taxes on households and businesses low. Households pay no state income or sales taxes, and most non-oil businesses pay about a third to half the taxes they would pay, if their taxes made up the same share of total revenues as in other states.[5]
- *Savings*. The state has saved about a quarter of its oil revenues, mostly in the Permanent Fund and the Constitutional Budget Reserve. Alaska's constitution prohibits spending the Permanent Fund principal, but the legislature can spend the earnings. The budget reserve makes loans to cover government spending, when there are budget deficits.

Low state taxes and high public spending have made Alaska a much more attractive place to live—as evidenced by the much bigger population. That's especially noticeable among older Alaskans, most of whom used to leave the state when they retired. Now, Alaskans 65 and older are the fastest-growing age group.

Oil and the Future

Earlier we imagined what Alaska's economy might have been like, without oil. But oil has been a reality in Alaska for 40 years, and even as production drops, the state has assets it lacked before oil—including better infrastructure, reduced living costs, and savings accounts that have the potential to produce billions of dollars in future earnings.

These legacies of oil help cushion the decline in oil production. But we can't be complacent. The huge North Slope oil discovery was incredibly lucky for Alaska—and we need to recognize that it was luck. We can't just count on more luck as our plan for the future. A better strategy is to take stock of what we have and build on our strengths. Here are some things to keep in mind as we look ahead:

- *Alaska's future prosperity depends on continued oil production.* Other economic drivers besides oil are also critical. The federal government supports one in three Alaska jobs. The seafood and tourism industries create thousands of seasonal jobs that are especially important in rural areas. Mining has a potentially bright future, and the air cargo industry is small but growing. The increasing number of older Alaskans is a less visible but real economic driver; when older residents spend their pensions, they create jobs. But all the likely growth in those drivers can't replace oil.
- *We shouldn't assume high oil prices can shield us forever from the effects of declining production on the state's North Slope lands.* Production is a third what it once was, and it's expected to continue dropping.
- *North Slope natural gas would add to the economic base but can't replace oil.* On an energy-equivalent basis, the current market value of oil is more than twice that of gas. It's also far more expensive to move gas to market. So the state's gas tax base, which is the market value minus transportation costs—the wellhead value—would be only a small fraction of the current wellhead value of oil production (Figure 7).
- *There's still a lot of oil on the North Slope and offshore.* We don't know just how much, but enough to support a thriving industry for generations (Figure 8). In the near-term, oil will come mainly from producing fields, which may have about 5 billion barrels of conventional oil remaining. There are other known but not yet producing fields on state land, and it's likely more will be found as exploration continues. Production from those fields will depend on economics. The North Slope also has billions of barrels of viscous and heavy oil, which is thick and expensive to produce. Very little of that is currently economic to produce, but the vast size of the reserves represents a tremendous opportunity. If the technological challenges of producing that oil can be overcome, it would generate a lot of jobs—but not the same level of state revenues as the older fields.

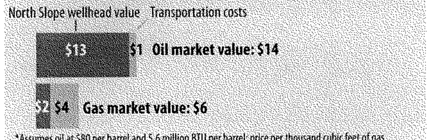
Beyond state lands, federal lands are currently estimated to have 33 billions barrels of technically recoverable oil, in both onshore and offshore areas. How much of that oil is actually produced will depend on geology, economics, technology—and politics.

What's the Next Step?

Given how important oil is and will continue to be, Alaskans should focus on developing a strategy that will provide the greatest long-term benefits from future oil production for the state, the economy, and Alaskans. What should we consider in such a strategy?

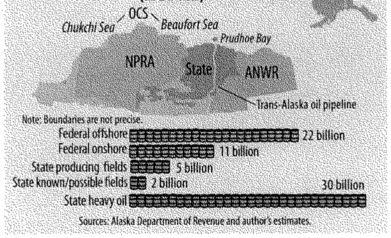
Figure 7. Value of Equivalent Energy from Oil and Natural Gas*

(1 million BTUs, or about one-sixth of a barrel of oil)



*Assumes oil at $80 per barrel and 5.6 million BTU per barrel; price per thousand cubic feet of gas

Figure 8. Potential North Slope Oil Reserves (In Barrels)



Sources: Alaska Department of Revenue and author's estimates.

- *Don't expect a home run: have realistic expectations about the benefits of future oil production*, compared with the enormous good fortune that came our way with past North Slope oil development. We'll have to work harder to craft policies that benefit Alaska.
- *Determine where the "sweet spot" lies: the level of oil taxation that promotes maximum long-term benefits for the state—in oil production, employment, and state revenues.* A first step would be maintaining an inventory of potential oil investments and assessing their sensitivity to different tax rates.
- *Resist the temptation to "do something"—that is, to use the state's oil wealth for economic diversification projects.* We've tried that in the past with little success. As oil revenues become tighter, the urge to spend them in attempts to diversify will increase—and put us at risk of making big, wasteful mistakes. A better bet is to conserve our oil wealth and benefit from its earning power.

Endnotes

1. See "What Drives the Alaska Economy?" *Understanding Alaska* Research Summary No.13, December 2008, by Scott Goldsmith. Institute of Social and Economic Research, University of Alaska Anchorage. Available at www.iser.uaa.alaska.edu.

2. Most Alaska businesses are not set up as corporations, but those that are corporations—generally the larger businesses— are subject to state corporate income taxes.

3. Total Alaska employment as we define it here is the sum of wage and salary jobs, active-duty military personnel, and an estimate of full-time equivalent jobs among self-employed Alaskans.

4. See note 1.

5. Taxes at such rates would shift a significant burden onto Alaska businesses, because in the absence of oil, the biggest economic driver is the federal government, which is exempt from state taxes.

Scott Goldsmith is a professor of economics at ISER who has studied Alaska's economy for 35 years. To see more of his work on the role of oil in the economy, or the entire *Investing for Alaska's Future* series, go to: www.iser.uaa.alaska.edu/Home/ResearchAreas/invest.html

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Mr. WHITFIELD. Thank you very much. Mr. Grafe, you are recognized for 5 minutes.

STATEMENT OF ERIK GRAFE

Mr. GRAFE. Thank you very much, Mr. Chairman, members of the committee. Thank you for inviting me to participate in today's hearing.

My name is Erik Grafe and I am an attorney with Earthjustice, national public interest conservation law firm. I work and reside in Anchorage, Alaska.

By way of background, Americans Arctic Ocean has sustained human communities for thousands of years and is home to some of the world's most iconic wildlife species. However, fundamental gaps exist in our basic scientific understanding of the region. Further, global warming is transforming it dramatically. In recent years, offshore oil and gas activities have also increasingly threatened the Arctic Ocean as permitting and planning decisions have been rushed forward without adequate baseline data, coordination, public involvement, or oil spill planning.

The bill under consideration today would add another threat. It seeks to create a loophole for offshore drilling in the Arctic Ocean by exempting it from the important protections of the Clean Air Act, one of the country's bedrock human health laws. This is no trivial matter. To put it in context, when Shell Oil Company proposed exploration drilling in the Chukchi Sea in 2010, its operations alone would have emitted roughly as much carbon dioxide as the annual household emissions of 21,000 people, or roughly 3 times the——

Mr. WHITFIELD. Mr. Grafe, excuse me. Could you move the microphone a little bit closer?

Mr. GRAFE. Sure. OK. It has got to be very close.

21,000 people or roughly three times the entire population of Alaska's North Slope borough. And that is just one drilling company drilling wells in one summer's drilling season.

I will focus on two of the most harmful provisions of this bill. First, the bill seeks to exempt a great majority of emissions from Arctic offshore drilling from stringent pollution controls. In the Arctic, the lion's share of pollution from offshore drilling is caused by vessels that accompany the drillship like icebreakers, not from the actual drillships themselves.

In Shell's proposed 2010 drilling, for example, up to 98 percent of air pollution came from Shell's associated vessels. This bill seeks to exempt those vessels from the Clean Air Act's Prevention of Significant Deterioration Program. The program, as its name suggests, is intended to prevent existing air quality levels from deteriorating. In 1990, President Bush signed into law an amendment to the Clean Air Act that applied the PSD program to offshore oil drilling. The program has two main tools for reducing air pollution, requiring that industry not violate quality standards and requiring that it apply best available control technology to reduce its pollution.

This bill would count emissions from associated vessels and icebreakers in determining whether drilling operations trigger the PSD requirements but then it would exempt those vessels from those requirements. It would apply the requirements only to the drillship. The icebreakers are the major source of pollution from offshore drilling.

And these emissions are a health concern. For example, in Shell's proposed 2010 drilling, icebreakers and support vessels could have emitted over 1,000 tons of nitrogen dioxide, a toxin for which even short-term spikes in concentration can prompt asthma, bronchitis, emphysema, and pneumonia. The bill would make it law that the oil industry does not have to apply the best available control technology to these or any other pollutants coming from its icebreakers. It would seriously undermine the purposes of the Clean Air Act and the PSD program.

Weakening health protections in the Arctic is particularly troubling because communities along the North Slope of Alaska have markedly higher rates of pulmonary disease and are substantially more vulnerable to mortality from air pollution. For example, rates of chronic lung disease on the North Slope are dramatically higher than in the general U.S. population.

Second, the bill seeks to limit the public's participation decisions about pollution from offshore that directly affect their health. For example, it would prevent citizens from seeking an administrative review of permits but would preserve that right for oil companies.

And it would limit the amount of time EPA has to grant or deny an air permit application. Again, the provisions are particularly troubling in the context of the Arctic because many of the communities most directly affected by Arctic offshore drilling decisions are remote and unconnected to the road system. These communities, moreover, will bear the vastly disproportionate burden of the pollution from offshore drilling. If anything, they should be given more time and opportunity to engage in meaningful public participation about decisions that disproportionately affect them. Instead, this bill significantly weakens those rights.

Protecting the Arctic and its people from air pollution that directly threatens human health and contributes to already rapidly changing climate in the region should be of the highest concern. This is what the Clean Air Act and the 1990 amendments were meant to do. This committee should not weaken these protections. It should reject this bill. Particularly in light of last spring's Deepwater Horizon oil spill, Congress should focus on facilitating a renewable energy future and science-based protective management of the Arctic Ocean, not on creating loopholes for offshore oil drilling in the region.

Thank you very much.

[The prepared statement of Mr. Grafe follows:]

Written Testimony of Erik Grafe
United States House of Representatives
Committee on Energy and Commerce
Subcommittee on Energy and Power
Hearing on H.R. ____,
"Jobs and Energy Permitting Act of 2011"

April 13, 2011

Members of the Committee, thank you for the invitation to participate in today's hearing. My name is Erik Grafe, and I am an attorney with Earthjustice, a national non-profit public interest law firm founded in 1971 dedicated to protecting the magnificent places, natural resources, and wildlife of this earth, and to defending the right of all people to a healthy environment. I work and reside in Anchorage, Alaska. My work focuses on protecting the health of the Arctic and its people.

America's Arctic Ocean has sustained human communities for thousands of years and is home to some of the world's most iconic wildlife species, including polar bears, whales, and walrus. However, fundamental gaps exist in scientific understanding of the Arctic Ocean, and much of the data that exists is decades old. Further, global warming is transforming the region. Melting sea-ice is threatening species such as the polar bear and walrus with extinction and affecting subsistence activities like whaling that are central to the traditional way of life of the region's indigenous Inupiat communities. In recent years, offshore oil and gas activities have increasingly threatened the Arctic Ocean. These activities have been rushed forward without adequate baseline data to analyze and manage their effects, without adequate coordination among agencies, without adequate public involvement, and without adequate oil spill technology. As a result, the Inupiat people and others have often been forced to seek redress in the courts to ensure that their voices are heard and that environmental laws are followed. It is time to reassess the way we make decisions about oil and gas activities in the Arctic Ocean, particularly in light of last spring's *Deepwater Horizon* oil spill. Rather than proceeding in a piecemeal, uncoordinated, and inadequately informed manner, the government should engage in a comprehensive planning process in which science and preparedness guide decisions about whether to allow industrial activities in the Arctic Ocean and, if so, under what conditions.

The bill that occasions today's hearing seeks to exempt offshore oil drilling in the Arctic Ocean from important protections of the Clean Air Act, one of the country's bedrock health laws, and to limit the public's right to participate in decisions that directly affect them. It is a transparent give-away to the oil industry. Since 2006, Shell Oil Company has tried unsuccessfully to push its way into exploration drilling in the Arctic Ocean. It has done so over the objections of communities and conservation organizations and despite an inability to comply with the Clean Air Act. We should not allow an end run around the important protections of the Clean Air Act. Rather than creating loopholes for oil companies—the same sort of loopholes that led to the *Deepwater Horizon* oil spill—Congress should allow the Environmental Protection Agency to do its job under the Clean Air Act and protect the health of the Arctic Ocean and its people.

My testimony today will provide a brief description of the exceptional values of the Arctic Ocean, the expansion of oil and gas activities in the region, and the need for an integrated, science-based management plan that protects the Arctic's people and wildlife before any new offshore drilling is considered in the region. I will also address the region's vulnerability to air pollution from offshore oil drilling, the importance of the Clean Air Act in protecting the Arctic and its people, and the principle reasons why the bill under consideration today should be rejected. Finally, I will address why Congress should be working to break our addiction to oil by encouraging a transition to sustainable renewable energy future and providing incentives for the many jobs and health benefits such a future will bring, rather than seeking to weaken crucial health and environmental standards for offshore oil drilling.

I. AMERICA'S ARCTIC OCEAN IS VIBRANT BUT VULNERABLE

A. America's Arctic Ocean

America's Arctic Ocean has sustained human communities for thousands of years. The Inupiat people have lived in the region and depended upon intact ecosystems to provide resources—such as fish, whales, walrus, seals, and seabirds—to support subsistence since time immemorial. These communities continue to practice subsistence traditions, harvesting a significant amount of food from the ocean and land. These practices are essential to Inupiat people's identity and culture. For many residents of the Arctic, then, there is a direct connection between the continued health of the Arctic Ocean and the health of their food supply and culture. The Arctic Ocean is critical even for those who live in lower latitudes; it exerts a powerful influence over the earth's climate and acts as an air conditioner for the planet.

The Arctic Ocean is also home to some of the world's most iconic wildlife species. To the north, the Chukchi and Beaufort seas support marine mammals such as bowhead, gray, and beluga whales; Pacific walrus; spotted, bearded, ribbon, and ringed seals; and polar bears. Migratory species from around the globe—including gray, humpback, minke, and killer whales, and millions of seabirds, shorebirds, and waterfowl—take advantage of the burst of summer productivity in the Arctic for breeding, feeding, and rearing of their young. To the south, the Aleutian Islands ecosystem is one of the most vibrant, dynamic ocean environments in the world. With over 450 species of fish, tens of millions of seabirds hailing from every continent and representing more than 50 species, 25 species of marine mammals, and coral gardens that rival the tropics, this rich and unique sea world is an international treasure. Between the Aleutian Islands and the Chukchi Sea lies the Bering Sea and Bristol Bay, home to some of the greatest salmon runs in the world.

Despite the cultural and biological significance of the Chukchi and Beaufort seas, there is a profound lack of basic scientific knowledge about the sea and the wildlife that inhabits it. Scientists lack basic scientific information about the abundance, distribution, migration, and role of almost all marine species in Arctic marine ecosystems. For example, data on the bowhead whale population structure, the fall migration through the Chukchi Sea, the amount of feeding in the Chukchi Sea in autumn, the summer use of the northern Chukchi Sea, and the general location in the lead system during spring migration are limited. Beluga whale feeding areas, late summer distribution, and fall migration patterns are poorly understood. Information on the distribution, abundance, age structure, population trends, and use of habitat is not available for fish populations in the Chukchi Sea. The current status of many marine and coastal bird species that use the Arctic Ocean is unknown or poorly understood.

As a result, scientists have a limited understanding of marine ecosystem structure and functioning in the Arctic. Even where basic information about the Arctic marine ecosystem exists, much of it is old or limited in scope. Studies designed to provide comprehensive information and understanding of the health, biodiversity, and functioning of Arctic marine ecosystems and the potential impacts of industrial activities were conducted 30 years ago pursuant to the Outer Continental Shelf Environmental Assessment Program. Much of the information is outdated for the rapidly changing Arctic, which greatly limits its usefulness in making decisions now.

While there is insufficient available scientific information about the Arctic Ocean to support ecologically sustainable development at this time, Arctic peoples have a wealth of local and traditional knowledge. However, mechanisms are generally lacking to make local and traditional knowledge accessible to agency managers or to integrate it effectively into the decision-making processes that affect Arctic ecosystems.

Compounding the lack of comprehensive, current data about the Arctic Ocean ecosystem, water temperatures and sea ice cover, which play important roles in Arctic marine ecology, are changing at a startling pace. Climate change is warming the Arctic nearly twice as fast as the rest of the world. In September 2007, the Arctic sea-ice extent hit a new record minimum that was 23 percent lower than the previous record low in 2005, 39 percent lower than the long term average from 1979-2000, and 50 percent below sea-ice conditions of the 1950s-1970s.[1] The sea-ice extent in the winter is also declining, as is the age and thickness of the ice that remains, while the length of the sea ice melt season is increasing.[2] The ice is melting far faster than projected by scientific models, with 2007 ice extent falling far below what any of the models projected for that year.[3] In fact the extent of Arctic sea ice loss in 2007 had already exceeded average scientific projections for 2050.[4]

Climate-related change, such as loss of sea ice cover, has profound effects on Arctic peoples, opportunities for the subsistence way of life, and Arctic marine ecosystems. Reduced ice cover makes fishing, hunting, and travel more difficult and unpredictable for Arctic peoples. Loss of sea ice also will have dramatic effects on many Arctic species. It almost certainly will result in a fundamental restructuring of the Arctic marine food web and may shift the flow of productivity from primarily benthic and ice-associated food webs to pelagic food webs. The reduction of sea ice also eliminates habitat for ice-dependent species such as walrus and polar bears. Loss of sea ice cover, the potential for seasonally ice-free conditions across the Arctic, and other climate-related changes are—and will continue to be—major stressors for many species in the Arctic. These changes may lead to local loss or extinction of species that cannot adapt to the rapidly changing conditions.

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[1] *See* 73 Fed. Reg. 28212, 28220-21 (May 15, 2008).
[2] *Id.* at 28222-23.
[3] *Id.* at 28233 (Figure 7).
[4] *Id.* (2007 ice extent below model ensemble mean for 2050).

The Arctic is also projected to be one of the first regions to be affected significantly by increased ocean acidification. Roughly one-third of the carbon dioxide that is added to the atmosphere from the combustion of fossil fuels will dissolve into seawater. There, it reacts to form carbonic acid, which increases the acidity of the water. This reaction is accelerated in cooler, less saline waters such as those of the Arctic Ocean. The Arctic's ice cover has acted as a barrier to carbon dioxide absorption and has slowed acidification of the polar sea. But as sea ice disappears, the surface waters of the Arctic Ocean will likely absorb carbon dioxide from the atmosphere at higher rates. Acidification will fundamentally shift the biogeochemical cycling of the Arctic Ocean. Among the most immediate impacts will be to shellfish and other marine organisms that create their shells and other hard parts from calcium carbonate. Increasing acidity will also change the growth rates of photosynthetic phytoplankton, the toxicity of marine toxins, the availability of ammonia for uptake by marine plants, and the efficiency of respiration in fish and other marine organisms. Changes brought about by ocean acidification could outstrip the adaptive capacity of many Arctic marine species.

B. Oil and Gas Activities in America's Arctic Ocean

Oil and gas activities are a relatively new phenomenon in America's Arctic Ocean. The first federal lease sale was held in this region just over thirty years ago, and even once the first sales were held, activities proceeded very slowly. Over the past decade, however, even in the face of rapid climate change and gaps in basic scientific baseline data that prevent informed management decisions, the pace of oil and gas activities in the Arctic Ocean has increased dramatically. These oil and gas activities are large-scale industrial undertakings involving drill ships, seismic surveying vessels that shoot very loud air guns into the water every several seconds over large areas to map subsurface geology, ice-breakers, supply vessels, helicopters, and airplanes. This activity introduces noise pollution into the water, disturbing marine mammals and other species that depend on sound to navigate, communicate, and locate food. It introduces pollution into the air and into the ocean. Drilling for oil also, of course, introduces the risk of oil spills into the ocean, where ice, storms, darkness, and the Arctic's remoteness would make clean-up nearly impossible. Ironically, the increased interest in drilling for oil in the Arctic Ocean, with its accompanying risks, is partly related to easier access as sea-ice extent shrinks due to climate change.

The current expansion of oil and gas activities in the Arctic began in the 2002-07 Outer Continental Shelf Oil and Gas Leasing Program, which scheduled three sales in the Beaufort Sea. The 2007-12 Outer Continental Shelf Oil and Gas Leasing Program dramatically expanded the areas open to oil and gas leasing in the North Aleutian Basin, Chukchi Sea, and Beaufort Sea from approximately 9.4 million acres to 78 million acres. Pursuant to those plans, the Minerals Management Service (MMS), renamed the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) following the 2010 *Deepwater Horizon* oil spill, held three separate lease sales in the Beaufort Sea that put more than 943,000 acres under lease to oil companies. In 2008, MMS held Lease Sale 193 in the Chukchi Sea and leased over 2.7 million acres to oil and gas companies. It was the first such sale in the Chukchi Sea since 1991, and prior to the sale there were no active leases or wells in the sea. Numerous oil companies, including Shell, ConocoPhillips, and Statoil, have indicated that they will seek permits to conduct exploration drilling in the Arctic Ocean beginning as early as 2012.

Oil and gas expansion in the Chukchi and Beaufort seas has been rushed and uncoordinated. Many agencies have management responsibilities in the Arctic, including the Environmental Protection Agency (EPA), the National Oceanic and Atmospheric Administration (NOAA), the Fish and Wildlife Service (FWS), the U.S. Coast Guard, and BOEMRE. Yet these agencies have not coordinated their permitting of oil and gas projects in recent years, complicating assessment and mitigation of the impacts of these activities. As a result of agencies' failure to coordinate, use adequate science, or seek community input when reaching decisions about offshore drilling in the Arctic Ocean, local communities and others in many instances have been forced to seek redress in the courts to ensure their voices are heard and to enforce compliance with the law. For example, in 2007 and 2008, the Ninth Circuit Court of Appeals enjoined drilling in the Beaufort Sea pursuant to lawsuits filed by local government, Alaska Native, and conservation entities that identified flaws in MMS's analysis and disclosure under the National Environmental Policy Act (NEPA).[5] In 2009, the District of Columbia Circuit Court of Appeals vacated the 2007-2012 Outer Continental Shelf Leasing Program, finding that the Program's environmental sensitivity rankings were "irrational" and violated the Outer Continental Shelf Lands Act.[6] In 2010, the Alaska District Court remanded the environmental impact statement and enjoined drilling on leases issued pursuant to Chukchi Sea

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[5] *See Alaska Wilderness League v. Kempthorne*, Nos. 07-71457, 07-71989, 07-72183 (9th Cir. July 19, 2007) (suspending exploration drilling program); *Alaska Wilderness League v. Kempthorne*, Nos. 07-71457, 07-71989, 07-72183 (9th Cir. Aug. 15, 2007) (order granting a stay of drilling pending adjudication of the case); *Alaska Wilderness League v. Kempthorne*, 548 F.3d 815 (9th Cir. 2008) (determining MMS failed to examine fully the potential impacts from drilling noise and disturbance on endangered bowhead whales and subsistence activities in violation of NEPA), *vacated and withdrawn*, 559 F.3d 916 (9th Cir. 2009), *dismissed as moot*, 571 F.3d 859 (9th Cir. 2009).

[6] *Ctr. for Biological Diversity v. U.S. Dept. of Interior*, 563 F.3d 466, 472 (D.C. Cir. 2009).

Lease Sale 193 after determining that MMS violated NEPA by failing to adequately address literally hundreds of instances of missing data about the sea and to analyze the effects of natural gas development.[7]

Shell's attempts to drill exploration wells in the Arctic Ocean illustrate well how shortcuts lead to bad agency decisions. Beginning in 2006, Shell Oil sought to obtain approval to drill in the Beaufort Sea, directly in the fall migration path of the endangered bowhead whale, the heart of Inupiat subsistence culture. Shell proposed to use two drill ships operating simultaneously, each accompanied by icebreakers and numerous other support vessels, to drill up to twelve exploration wells over three years. Despite the scale of the industrial undertaking, Shell sought to avoid preparation of an environmental impact statement or a public comment process for the project. MMS approved the exploration plan on the basis of an abbreviated environmental assessment, and, as described above, the Ninth Circuit stayed the drilling. In 2007, Shell also insisted on disaggregating emissions from its multiple drill sites to avoid having to apply technology controls to its ships under the Clean Air Act's Prevention of Significant Deterioration (PSD) program. When the Region 10 office of EPA issued minor source permits for Shell's proposed, the Environmental Appeals Board (EAB), an administrative body within the EPA set up to review the agencies decisions, remanded the permits for failing to meet the requirements of the Clean Air Act.[8] In 2008, Shell again tried to obtain minor source permits, but eventually withdrew the permits before the EAB could review them. For its plans to drill in 2010, which proposed operations in both the Chukchi and Beaufort seas and were in many ways larger in scale than its 2007 plan, Shell again sought approval from MMS without preparation of an environmental impact statement. And, although it applied to EPA for major source permits under the Clean Air Act, it still sought shortcuts, trying, for example, to postpone the time at which its drill ship became subject to regulation. EPA Region 10 issued two PSD permits to Shell in the spring of 2010, but the EAB determined that these permits violated the Clean Air Act and remanded them, finding "clearly erroneous" EPA's analysis of whether the Inupiat communities along the Arctic coast would experience disproportionately adverse health effects from drilling emissions and determining that EPA did not provide a "cogent, reasoned explanation of its" adoption of Shell's approach to determining when the drill ship become a stationary source subject to regulation.[9]

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[7] *Native Vill. of Point Hope v. Salazar*, 730 F. Supp. 2d 1009 (D. Alaska 2010).

[8] *In re Shell Offshore Inc., Kulluk Drilling Unit and Frontier Discoverer Drilling Unit*, OCS Appeal Nos. 07-01 and 07-02 (EAB, Sept. 14, 2007).

Shell continues to try to take shortcuts that skirt the law. In January of this year, after EPA Region 10 had been ordered to reconsider the air permits it issued to Shell, Shell pressed the EPA in filings with the EAB to exempt its operations from newly applicable health standards, such as the new nitrogen oxides (NO_2) ambient air quality standards, when it re-issues revised permits. In March of this year, Shell announced plans to use two drill ships to simultaneously drill up to four wells in the Chukchi Sea up to two wells in the Beaufort Sea each year in 2012 and 2013. This would be the biggest single drilling campaign the American Arctic Ocean has ever seen. Shell has applied to EPA for only a minor source permit for the drill ship it proposes to use in the Beaufort Sea, which would avoid the application of pollution control technology to the ageing ship.

The poor decisions described above can largely be ascribed to Shell's consistent attempts to take shortcuts and to limit the analysis of and public participation in permitting decisions. Agencies should not yield to Shell and others' pressure to skirt environmental laws in permitting offshore oil drilling; and this Committee should resist pressure to amend those laws to exempt oil companies from their requirements. Permitting oil and gas activities to go forward without full compliance with existing environmental and health laws and without an adequate understanding of the Arctic Ocean ecosystem is risky and potentially devastating. Offshore oil exploration is loud, dirty, and large. It poses significant threats to the health of the Arctic Ocean. The most obvious and dramatic of these threats, as the world recently witnessed in the *Deepwater Horizon* tragedy, is a large oil spill in Arctic waters. A significant oil spill in Arctic waters could have crippling effects on the ecosystem, wildlife, and people in the Arctic. Spilled oil could kill or severely injure marine mammals including whales, seals, polar bears, walrus, seabirds, and fish, and could destroy now pristine waters and shorelines. It could render subsistence resources unusable for multiple years. All of these impacts likely would have a dramatic, negative effect on the people who depend on these animals and places. Further, there is no proven technology to clean up a spill in the remote, icy conditions of the Arctic Ocean, and a spill at the wrong time could gush for months under the winter sea-ice before attempts could be made to stop it.

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[9] *In re Shell Gulf of Mexico, Inc. & Shell Offshore, Inc.*, OCS Appeal Nos. 10-01 through 10-04 at 3, 8 (EAB, Dec. 30, 2010).

Oil and gas activities also cause a substantial amount of noise in the Arctic marine environment, where marine mammals and fish rely heavily on sound to communicate and to locate food. In addition to bringing noisy icebreakers, drill rigs, and other vessels to the Arctic, oil and gas exploration involves shooting seismic guns to the ocean floor. These seismic surveys are used by the oil and gas industry to generate a picture of the offshore subsurface geology. The sounds they make are literally deafening. A single seismic air-gun blast is many times louder than a rocket launching and is comparable to a volcano erupting beneath the ocean. However, unlike a rocket launch or a volcanic eruption, these guns do not blast just once. They sound repeatedly over vast expanses of the Arctic Ocean for days, weeks, and even months at a time, and can be heard underwater from hundreds of miles away. The noise from seismic surveys can disrupt important behaviors such as feeding, breathing, communication and social bonding of marine mammals within several miles of an active survey. In addition to the direct threats from oil spills, noise, and air pollution, oil and gas activities bring industrialization to a place where all facets of life traditionally have focused on a relationship with the land and sea. This industrialization continues to dramatically affect Arctic people.

Gaps in basic information about the Arctic Ocean severely hamper attempts to analyze and disclose the potential impacts of oil and gas activities in the region, let alone manage and mitigate them. As described further below, in the face of information gaps and in the absence of an effective way to clean up spilled oil in the Arctic Ocean, the government must not rush to permit offshore drilling in the Arctic; it must proceed cautiously and deliberately and obtain the information it needs to effectively manage the region to protect its people and wildlife.

II. A COMPREHENSIVE SCIENCE-BASED PLANNING PROCESS THAT PROTECTS THE ARCTIC OCEAN AND ITS PEOPLE MUST PRECEED OIL DRILLING IN THE ARCTIC OCEAN

As described above, the Arctic Ocean is home to invaluable cultural and natural treasures. But it is also under tremendous stress from rapid climate change and, increasingly, oil and gas activities. In light of the large gaps in basic science about the region and the tremendous risks associated with oil drilling in the Arctic Ocean, the various government agencies responsible for managing the Arctic Ocean must coordinate more closely. Before oil drilling is considered in the Arctic Ocean, these agencies must understand the ecosystem, including how it is shifting due to climate change, and must ensure that, if drilling is allowed, a spill could be contained and cleaned in the Arctic's extreme remote, stormy, dark, and icy conditions. Without a better understanding of the ecosystem, it is not possible to make informed management decisions about whether, where, and how to permit drilling. Without proven effective means to clean up an oil spill if one happens, it is irresponsible and deeply unfair to the Inupiat communities along the Alaskan coast to allow oil drilling in the Arctic Ocean.

A. Comprehensive Research Plan

Working together, Arctic Ocean resource management agencies, including NOAA, FWS, EPA, BOEMRE, and the U.S. Geological Survey (USGS), must undertake a comprehensive research program that provides the basic information required to protect the resources and subsistence activities of the Arctic. The research program could be similar to the Outer Continental Shelf Environmental Assessment Program undertaken some 30 years ago.

Over the past several years, a widespread consensus has developed, that there are major gaps in our basic understanding of the Arctic Ocean, and that this lack of data hinders informed management of the region.

- In January 2011, the National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling stated in its final report: "Scientific understanding of environmental conditions in sensitive environments . . . in areas proposed for more drilling, such as the Arctic, is inadequate. The same is true of the human and natural impacts of oil spills."[10] In light of these concerns, the Commission recommended "an immediate, comprehensive federal research effort to provide a foundation of scientific information on the Arctic (with periodic review by the National Academy of Sciences), and annual stock assessments for marine mammals, fish, and birds that use the Beaufort and Chukchi Seas."[11] The report concludes that specific information should be gathered through research "with specific timeframes in mind in order to inform the decision-making process."[12]

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[10] National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling, Deep Water The Gulf Oil Disaster and the Future of Offshore Drilling Report to the President at vii (January 2011) (Spill Commission Report), *available at* http://www.oilspillcommission.gov/final-report; *see also id.* at 301 ("Environmental and biological conditions are at least as well understood along the Atlantic coast as in the Gulf—and there are also important facilities, such as Coast Guard installations in place; in contrast, equivalently detailed geological and environmental information does not exist for the Arctic exploration areas of greatest interest for energy exploration—and industry and support infrastructures are least developed, or absent, there.").

[11] *Id.* at 303.

- In July 2010, the Interagency Ocean Policy Task Force stated in its final report that one of the priority needs for addressing environmental stewardship of the rapidly changing Arctic Ocean is "[i]mprovement of the scientific understanding of the Arctic system and how it is changing in response to climate-induced and other changes."[13]
- In May 2010, Secretary Salazar canceled the remaining Arctic leases sales in the 2007-12 Outer Continental Shelf Leasing Program, stating "that the country must take a cautious approach in the Arctic, and gather additional scientific information about resources, risks, and environmental sensitivities before making decisions about potential future lease sales in frontier areas."[14] He directed the USGS to conduct an evaluation of scientific needs in the region "[t]o better understand the resilience of Arctic coastal and marine ecosystems to potential OCS resource extraction activities."[15]
- Also in May 2010, the U.S. Arctic Research Commission stated: "Fundamental baseline scientific information is lacking for living resources in . . . much of the region, and basic biological aspects, such as the ecology of the area, and the spatial habitat of flora and fauna that might be at risk from spills are poorly known."[16]
- In September 2009, the NOAA stated in comments on the Bush Administration's proposed 2010-15 Outer Continental Shelf Leasing Program for: "NOAA believes that no leasing

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[12] *Id.* at 303.

[13] Council on Environmental Quality, Final Recommendations of the Interagency Ocean Policy Task Force at 40 (July 19, 2010), *available at* http://www.whitehouse.gov/files/documents/OPTF_FinalRecs.pdf.

[14] Department of the Interior, Fact Sheet, A Comprehensive, Science-Based Offshore Energy Plan at 1 (May 27, 2010), *available at* http://www.doi.gov/deepwaterhorizon/loader.cfm?csModule=security/getfile&PageID=33566.

[15] *Id.*

[16] U.S. Arctic Research Commission, White Paper, U.S. Arctic Research Commission Recommends Steps to Expanded U.S. Funding for Arctic/Subarctic Oil Spill Research– Final Draft at 2 (May 26, 2010), *available at* http://www.arctic.gov/publications/usarc_oilspill_5-26-10.pdf.

should occur in the Arctic Sea [sic] under this proposed plan until additional information is gathered and additional research is conducted and evaluated regarding oil spill risk; adequate response and preparedness to spills in the Arctic; and possible human dimension impacts on Alaska Native cultures from oil and gas exploration activities and potential oil spills."[17] It noted that "[t]here are also gaps in our understanding of how some species utilize habitat in the Arctic and how behavioral responses to seismic airguns may or may not exclude marine mammal from these habitats, particularly in the face of potentially increasing levels of exploration and development."[18]

- In August 2009, the North Pacific Fishery Management Council voted to implement the Fishery Management Plan for the Arctic, which closed the Arctic Ocean management area to commercial fishing "until sufficient information is available to support the sustainable management of a commercial fishery."[19] The Council stated further that "[v]ery little is known of [Arctic] marine fish distribution, abundance, diversity, or habitat use patterns in the winter,"[20] that "[i]n 2008, data were scarce for estimating the abundance and biomass of fishes in the Alaskan Arctic,"[21] and that "[f]urther information and work is necessary to determine the extent to which benthic and pelagic food webs may be linked in the Alaskan Arctic as they are in the Bering Sea."[22]
- In environmental impact statements prepared in connection with oil and gas lease sales in the Arctic Ocean under prior Outer Continental Shelf Leasing Programs, BOEMRE repeatedly

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[17] National Oceanic and Atmospheric Administration (NOAA), Comments on the U.S. Department of the Interior/Minerals Management Service Draft Proposed Outer Continental Shelf Oil and Gas Leasing Program for 2010-2015 at 5 (Sept. 9, 2009).

[18] *Id.* at 9.

[19] North Pacific Fishery Management Council, Fishery Management Plan for Fish Resources of the Arctic Management Area at ES-1 (Aug. 2009).

[20] *Id.* at 43.

[21] *Id.* at 9.

[22] *Id.* at 58.

acknowledged that gaps in basic science about the Arctic Ocean hinder the agency's assessment of the effects of oil and gas activities there. For example, MMS stated in the final environmental impact statement for Chukchi Sea Lease Sale 193 the lack of data on "marine mammal distributions and habitat use in offshore areas of the Chukchi Sea," prevented it from determining the potential level of effects oil and gas development could have on marine mammals.[23] A draft supplemental environmental impact statement for the lease sale, prepared pursuant to a court-ordered reconsideration of the leases, required a 140-page appendix to chronicle the instances in the original environmental impact statement in which MMS acknowledged that it did not have data potentially relevant to the effects of oil and gas activity in the sea.[24] Similar data gaps exist for the Beaufort Sea.[25]

Agencies that manage the Arctic Ocean should work together to obtain baseline data for the region. They should undertake a research program designed to provide comprehensive data on the health, biodiversity, and functioning of Arctic marine ecosystems and the potential impacts of industrial activities there. A comprehensive effort to study the ecosystem as a whole and to integrate or comprehensively synthesize the more-focused studies that are ongoing in the Arctic Ocean is needed.

Any future comprehensive study program must consider traditional knowledge and wisdom of indigenous communities along the coast of the Arctic Ocean that have lived and hunted in the region for millennia. Traditional knowledge can help fill some of the gaps in our understanding of Arctic ecosystems as well as guide future efforts to collect necessary information. Outreach to local communities, governments, tribes, co-management organizations, and other Alaska Native organizations is one way of incorporating not just knowledge, but the holders of that knowledge into the decision-making process. In recent years, an increasing amount of research has focused on traditional knowledge in the Arctic. Major projects, such as the Arctic Council's Arctic Climate Impact Assessment, have incorporated traditional knowledge in efforts to understand what is taking place in the region. Nonetheless, there is much more to be done to make the knowledge of Arctic peoples more widely available, such as incorporating traditional knowledge in management processes that directly impact people.

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[23] Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE), Chukchi Sea Planning Area Oil and Gas Lease Sale 193 in the Chukchi Sea, Alaska, Draft Supplemental EIS, OCS EIS/EA BOEMRE 2010-034 at App. A (Sep. 2010).

[24] BOEMRE, Chukchi Sea Planning Area, Oil and Gas Lease Sale 193 in the Chukchi Sea, Alaska, Draft Supplemental Environmental Impact Statement, OCS EIS/EA BOEMRE 2010-034 (Sep. 2010) at App. A.

[25] *See, e.g.*, Minerals Management Service (MMS), Environmental Assessment, Proposed OCS Lease Sale 202 Beaufort Sea Planning Area, OCS EIS/EA MMS 2006-001 at 28 (August 2006) ("Information on current distribution and abundance (e.g., density per square kilometer) estimates, age structure, population trends, or habitat use areas are not available or are outdated for fish populations in the western Beaufort Sea."); 109 ("Quantitative data is lacking that specifically addresses the potential cumulative impacts of development on polar bears and the effects of disturbance related to human activities on polar bear-habitat use, as well as recruitment and survival."); 56 ("With the limited background information available regarding large oil spills in the offshore arctic environment, the outcome of a large oil spill is uncertain.").

Some of the mechanisms for such an integrated approach are already being developed. For example, on July 19, 2010, President Obama signed Executive Order 13547, which established a National Policy for the Stewardship of the Ocean, our Coasts, and the Great Lakes.[26] Among other things, the executive order established the National Oceans Council and adopted the Final Recommendations of the Interagency Ocean Policy Task Force. Those recommendations identified changing conditions in the Arctic as one of nine national priority objectives and called on the Council to develop a strategic action plan to address environmental stewardship needs in the Arctic Ocean and adjacent coastal areas in the face of climate-induced and other environmental changes.[27] The National Ocean Council's Arctic strategic action plan can and should set out a plan for an integrated approach to attaining a better understanding of the Arctic Ocean.

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[26] 75 Fed. Reg. 43,023, 43,023 (July 22, 2010).

[27] Council on Environmental Quality, Final Recommendations of the Interagency Ocean Policy Task Force at 6 (July 19, 2010), *available at* http://www.whitehouse.gov/files/documents/OPTF_FinalRecs.pdf.

If the federal government commits to comprehensive, long-term research and monitoring in the Arctic Ocean, managers will be in a much better position to determine if, when, where and how industrial activities should occur. A comprehensive research and monitoring program could be conducted in three simple phases over the next five to seven years: (1) gap analysis and planning (2011-2012); (2)research and monitoring (2013-2016, with monitoring continuing into the future); and (3)integrating new and older information to provide decisions-makers the basic understanding needed to make effective decisions (2016-2017). As described above, each of these phases must be informed by local and traditional knowledge, including planning and peer-review. The basic understanding garnered by this program would enable managers to determine if, when, where, and how industrial activities should occur, and could facilitate the identification of alternatives that may allow for development while protecting the ecosystem and subsistence way of life.[28]

B. Oil Spill Prevention, Containment, and Cleanup

In addition to a comprehensive effort to gather missing baseline data to guide management decisions in the Arctic Ocean, advances must be made in oil spill prevention and clean-up infrastructure and technology before oil drilling is permitted in the Arctic Ocean. Last spring's *Deepwater Horizon* oil spill tragically demonstrated the consequences of a large oil spill and the limits of containing such a spill, even in the relatively benign conditions of the Gulf of Mexico. As the final report of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling made clear, a large spill in the Arctic Ocean would be even more difficult to contain and clean up. In its report, the Commission expressed "serious concerns about Arctic oil-spill response, containment, and search and rescue."[29] The Commission Report explained: "The remoteness and weather of the Arctic frontier create special challenges in the event of an oil spill."[30] It specifically cautioned that "[s]uccessful oil-spill response methods from the Gulf of Mexico, or anywhere else, cannot simply be transferred to the Arctic."[31] For example, the Commission explained "[s]pill trajectory and weather models based on Arctic conditions must [] be developed."[32]

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[28] President Obama and Secretary Salazar have directed the U.S. Geological Survey to assess information gaps and "environmental sensitivities in Arctic areas." *See* Secretary Salazar Unveils Arctic Studies Initiative that will Inform Oil and Gas Decisions for Beaufort and Chukchi Seas, *available at* http://www.doi.gov/news/pressreleases/2010_04_13_releaseA.cfm. This review of Arctic science is a good first step and could form the basis for a comprehensive gap analysis and subsequent development of a research and monitoring plan.

Additionally, the Commission expressed concerns that "[c]urrent federal emergency response capabilities in the region are very limited."[33] The Report noted that "[t]he Coast Guard does not have sufficient ice-class vessels capable of responding to a spill under Arctic conditions: two of its three polar icebreakers have exceeded their service lives and are non-operational" and that "[w]ithout a presence in the Arctic, it would be very difficult for the Coast Guard to conduct any emergency search and rescue operations."[34] These and other concerns echo the problems identified by communities, conservation groups, and others in recent years.[35]

In light of these concerns, the Commission made three recommendations for action *before* the government "makes a fully informed determination that drilling in a particular area is appropriate."[36] First, the government should ensure that the spill response plans proposed by industry are adequate for each stage of development and that the underlying financial and technical capabilities have been satisfactorily *demonstrated* in the Arctic.[37] Second, the Coast Guard and the oil companies operating in the Arctic "should carefully delineate their respective responsibilities in the event of an accident, including search and rescue, and then . . . build and deploy the necessary capabilities."[38] Third, Congress should provide "the resources to establish Coast Guard capabilities in the Arctic, based on the Coast Guard's review of current and projected gaps in its capacity."[39]

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[29] Spill Commission Report at 304.
[30] *Id.* at 303.
[31] *Id.*
[32] *Id.* at 304.
[33] *Id.*
[34] *Id.*
[35] Indeed, a recent oil spill in Norway when a container ship, the "Godafoss", ran aground off of Norway's southern coast on February 17 demonstrates the immense difficulties of cleaning up oil in the icy conditions that prevail in the Arctic Ocean. *See* APRN, Cleanup Slow Going in Norway Spill (Feb. 28, 2011), *available at* http://eyeonthearctic.rcinet.ca/en/news/norway/85-environment/745-cleanup-slow-going-in-norway-spill.
[36] Spill Commission Report at 304.

The Commission's recommendations bolster the conclusion that decisions to allow drilling in the Arctic Ocean are premature given the state of our baseline understanding and ability to respond to a major oil spill. Certainly, before dangerous oil drilling is considered in the Arctic Ocean, a comprehensive research plan needs to be undertaken to gather information about the region that can form the basis of informed management decisions about whether, where, and how to permit oil drilling in the Arctic Ocean.

III. THE CLEAN AIR ACT IS VITAL TO PROTECTING THE ARCTIC AND ITS PEOPLE

As described above, it is premature to consider drilling for oil in the Arctic Ocean. However, if drilling is considered, it is essential that those decisions be made considering only activities subject to the full protections of the Clean Air Act.

A. The Arctic is Particularly Vulnerable to Air Pollution

If not properly regulated, air pollution in the Arctic could have dramatic adverse effects on the health of the region's indigenous Inupiat communities and can accelerate already dramatic climate change in the region, with potentially global implications.

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[37] *Id.*
[38] *Id.*
[39] *Id.*

As described above, the Inupiat have a long and vibrant heritage of relying upon the abundant marine life in this area to feed their people. Their subsistence way of life is the basis of their culture and critical to the Inupiat diet. The rush to discover marketable oil and gas resources, develop new shipping routes, and otherwise access the American Arctic Ocean threatens dramatic adverse impacts on Inupiat culture and the fragile environment upon which the culture is based. Air pollution from increased industrial activity, particularly oil and gas activity, is a primary concern, because operations that pollute the air and water also contaminate the food sources upon which the Inupiat rely and threaten their health.

Communities along the North Slope of Alaska have markedly higher rates of pulmonary disease than the general U.S. population, and may have genetic predispositions to disease that differ from other U.S. populations. As abundant public health data has demonstrated, the Inupiat are substantially more vulnerable to morbidity and mortality from air pollution than are other Americans. For example, rates of chronic lung disease on the North Slope are dramatically higher than in the general U.S. population.[40]

As EPA and other federal agencies have acknowledged, the Arctic and its people are also particularly vulnerable to the effects of climate change, and the region is warming faster and changing more precipitously than most other regions in the world.[41]

Climate change is already harming Arctic communities and thousand-year-old Alaska Native cultural traditions. "Among the most profound changes is the loss of sea ice, which is at the lowest levels in 800 years."[42] This loss of sea ice has caused subsistence hunters to "travel farther across thinner ice, and sometimes open seas, to access the animals" on which they depend, and has even directly harmed populations of animals that serve as subsistence resources.[43] Available methods of processing and storing subsistence resources are already growing less effective as "ice cellars are melting and food spoilage is becoming more common."[44] This harm to subsistence resources endangers the welfare of the Inupiat people, because of the central role these resources play in community health and cultural traditions. Subsistence diets are high in health-promoting nutrients, while "[r]eplacement of subsistence foods with store-bought foods in Alaska Native communities increases the risk of 'metabolic disorders' such as hypertension, diabetes, and high cholesterol and the common complications of these disorders, such as cardiovascular disease and strokes."[45] "The loss of sea ice, coupled with melting permafrost, is also accelerating coastal erosion, forcing communities to relocate, and threatening habitat for waterfowl, and caribou, which are also important food sources for indigenous people."[46] If the fundamental role of subsistence is displaced by industrial development in the region, very significant increases in obesity and diabetes in the impacted communities would be predicted to follow.

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[40] MMS, Beaufort Sea and Chukchi Sea Planning Areas Oil and Gas Lease Sales 209, 212, 217, and 221 Draft Environmental Impact Statement, OCS EIS/EA MMS 2008-0055 (2008 DEIS) at 3-232 (Nov. 2008).

[41] *See, e.g.*, 74 Fed. Reg. 66,496, 66,535 (Dec. 15, 2009).

[42] Anne E. Gore, *Broken Promises: The Reality of Oil Development in America's Arctic*, (Broken Promises) at 41 (2009) *available at* http://wilderness.org/files/Broken-Promises-Report.pdf.

The rapidly warming Arctic also threatens with extinction iconic ice-dependent species that call the Arctic Ocean home. The Department of Interior has found the polar bear threatened with extinction and listed it under the Endangered Species Act. The primary threat to the species is the climate-change induced melting of the Arctic sea ice.[47] Interior has also deemed the Pacific walrus, another ice-dependent species that calls the Arctic Ocean home, to be threatened with extinction because of rapid climate change.[48]

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[43] *Id.*

[44] 2008 DEIS at J-23.

[45] *Id.* at J-14; *see also generally* S.O. Ebbesson et al., *Diabetes is Related to Fatty Acid Imbalance in Eskimos*, 58 International J. of Circumpolar Health 108 (1999); R. Shephard & A. Rode, The Health Consequences of Modernization: Evidence from Cirumpolar Peoples (1996); T. Curtis et al., *Changing Living Conditions, Lifestyle, and Health*, 64 International J. of Circumpolar Health 442-450 (2005); M. Jorgensen et al., *Diabetes and impaired glucose tolerance among the Inuit of Greenland*, 26 Diabetes Care 1766 (2002); B. Zinman, *Diabetes in indigenous populations: genetic susceptibility and environmental change, available at* http://www.d4pro.com/idm/site/vol_16,_no_1,_2004.htm; S Ebesson et al., *Diabetes and impaired glucose tolerance in three Alaskan Eskimo Populations*, 21 Diabetes Care 563 (1998); P. Hogan et al., *Economic Costs of Diabetes in the U.S. in 2002*, 26 *Diabetes Care* 917 (2003).

[46] Broken Promises at 41.

Protecting the Arctic and its people from air pollution that directly threatens human health, the health of subsistence resources, and causes or contributes to already rapid climate change is therefore of the highest concern.

B. Air Pollution from Offshore Oil Drilling is a Major Concern

Offshore oil drilling is a large industrial undertaking that emits tons of pollution harmful to human health and the environment. Although millions of acres have been leased to oil companies in the last decade, there has been almost no new exploration drilling in the Arctic Ocean over that period. However, there is immense pressure by industry to start drilling: Shell has said it wants to drill up to four wells in the Chukchi Sea and two wells in the Beaufort Sea using two different drill ships to drill simultaneously in each sea starting as early as 2012, and ConocoPhillips and Statoil also have announced that they intend to drill in the Chukchi Sea starting as early as 2013.

The scale of the industrial activity at issue in these drilling plans is well illustrated by plans Shell proposed in 2010 to conduct exploration drilling in the Chukchi and Beaufort seas.

Shell's proposed exploration program was a massive industrial undertaking. Shell planned to conduct its drilling in both the Chukchi and the Beaufort seas using the 514-foot-long, ice-reinforced drill ship *Frontier Discoverer*, which would be affixed to the seafloor using eight, seven-ton anchors. The *Discoverer* would be accompanied by a fleet of large vessels comprised of an ice-management vessel, an anchor-handling vessel, a supply vessel, a berthing vessel, at least two oil-response vessels, and other work boats. Frequent helicopter and fixed-wing aircraft trips and the establishment of shore-bases at Wainwright, Barrow, and Deadhorse would support the drilling operations.

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[47] 73 Fed. Reg. 28212 (May 15, 2008).
[48] 76 Fed. Reg. 7634 (Feb. 10. 2011).

Shell's proposed 2010 operations would have potentially emitted thousands of tons of pollution into the air, including particulate matter, sulfur dioxide, nitrogen oxide, and carbon monoxide, all of which threaten human health.[49] The lion's share of Shell's pollution—between 75 and 96 percent of the total of each regulated pollutant—would have been emitted not by the drill ship itself but by the vessels supporting that ship, like the ice-breakers.[50]

To put the operations in context, Shell's 2010 Chukchi Sea drilling alone would have released as much particulate matter (PM_{10}) pollution as over 825,000 cars driving 12,000 miles in a year.[51] With numerous companies holding leases in the Arctic Ocean, it would be possible to envision as many as 2-3 separate drilling operations per year. This could equate with the emissions of over 2 million cars driving 12,000 miles a year, all within the short, open-water drilling season. Shell's operations would have emitted high levels of fine particulate matter, a major health and, through black carbon, global warming concern. For example, its Beaufort Sea operations had the potential to emit 57 tons per year of fine particulate matter ($PM_{2.5}$). These emissions could almost double the short-term level of fine particulate matter in the coastal community of Kaktovik. However, even these estimates may not even fully have reflected Shell's potential emissions of fine particulate matter, because the EPA did not analyze secondary fine particulate matter formation from emission such as nitrogen oxides (NO_X), and

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[49] Environmental Protection Agency (EPA), Region 10, Statement of Basis for Proposed OCS PSD Permit No. R10OCS/PSD-AK-09-01, Shell Gulf of Mexico Inc., Frontier Discoverer Drillship, Chukchi Sea Exploration Drilling Program (Jan. 8 2010) (Chukchi Statement of Basis), App. A at A-1.

[50] *Id.*

[51] EPA estimates that the average passenger car emits .14 pounds of particulate matter (PM_{10}) per year. EPA Office of Transportation, Emission Facts – Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks (EPA420-F-05-022) (August 2005), available at https://www.whatcomsmarttrips.org/pdf/Emission%20Facts%202005.pdf.

Shell's Beaufort Sea operations had the potential to emit over 1,371 tons per year of nitrogen oxides (NO_X), potentially allowing concentrations to reach more than 78 percent of the applicable air quality limit. Shell's operations also had the potential to emit 94,000 tons of CO_2—roughly equivalent to the annual household CO_2 emissions of 21,000 people, or roughly three times the entire population of the North Slope Borough.[52]

Shell's emissions from its proposed 2010 operations would have been potentially harmful to the health of residents in Arctic coastal communities. Its emissions of nitrogen dioxide, NO_2, for example, was a major cause for concern. Studies indicate an association between nitrogen dioxide and lung function. A Southern California Children's Study "showed that lung function levels among nine to 16 year old children were lower in communities with higher NO_2 concentration."[53] Studies as a whole indicate that even short-term spikes in concentrations can prompt additional emergency department visits and hospital admissions for "asthma, bronchitis and emphysema . . . , pneumonia, [and] upper and lower respiratory infections . . . ." 74 Fed. Reg. 34,404, 34,413 (July 15, 2009). Further nitrogen dioxide reacts with other compounds to form other harmful pollutants, like fine particulate matter and ozone.

Shell's emissions of fine particulate matter ($PM_{2.5}$) were also of concern. Shell proposed operations would have almost doubled fine particulate matter concentrations in Kaktovik and could have caused fine particulate matter levels to reach 83 percent of the National Ambient Air Quality Standards in the Beaufort Sea and 84 percent of the air quality standards in the Chukchi Sea. This is worrisome because fine particulate matter pollution can cause negative health effects. Fine particulate matter pollution can get deep into the lungs, and may even get into the bloodstream. Exposure to such particles can affect both lungs and heart. According to EPA, numerous scientific studies have linked particulate pollution to a variety of problems, including: increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; decreased lung function; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Particulate matter pollution is most likely to affect people with heart or lung diseases, children, and older adults. However, even healthy people may experience temporary symptoms from exposure to elevated levels of particle pollution. A World Health Organization working group has found that current ambient levels of particulate matter pollution in Europe could "lead to a marked reduction in life expectancy," perhaps up to a few years, primarily due to " increased cardio-pulmonary and lung cancer mortality."[54]

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[52] Shell Offshore Inc., Outer Continental Shelf Pre-Construction Air Permit Application, Frontier Discoverer, Beaufort Sea Exploration Drilling Program at 98 (Jan. 2010); United States EPA, Climate Change – Greenhouse Gas Emissions, In the Home, *available at* http://www.epa.gov/climatechange/emissions/ind_home.html.

[53] World Health Organization, Health Aspects of Air Pollution with Particulate Matter, Ozone and Nitrogen Dioxide at 49 (Jan. 2003).

Shell's operations would also contribute to Arctic climate change. Shell's drilling operations have the potential to emit 94,000 tons of carbon dioxide, the most important driver of global and Arctic climate change. Also, a significant fraction of the more than 50 tons per year of fine particulate matter Shell would have emitted would be black carbon.[55] Black carbon is generally regarded as the second most important contributor to Arctic warming after carbon dioxide. Black carbon warms the environment by absorbing sunlight in the atmosphere, thereby capturing heat energy, and it darkens snow and ice after falling to earth, thus reducing the reflection of sunlight and accelerating melting.[56] Emissions of black carbon from sources in the Arctic itself are particularly troubling, as Arctic emissions are far more likely to come in contact with and melt Arctic snow and ice.[57] One recent study indicates that Arctic black carbon emissions are 10-100 times more important with respect to contributing to Arctic black carbon radiative forcing than emissions outside of the Arctic.[58]

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[54] *Id.* at 13-14.

[55] Sarofim et al., Ad hoc Working Group, Current Policies, Emission Trends and Mitigation Options for Black Carbon in the Arctic Region (EPA Draft White Paper) at 21-22 (Apr. 28, 2009).

[56] *Id.* at 7.

C. The Clean Air Act Protects Human Health from Offshore Drilling Air Pollution

The Clean Air Act is a landmark public health statute that has prevented hundreds of thousands of premature deaths over the past forty years, all while our national GDP has steadily risen. In 2010 alone, the Act is estimated to have prevented 160,000 adult deaths from particle pollution, 230 infant deaths from particle pollution, and 86,000 emergency room visits. By 2020, the Act is estimated to have resulted in two trillion dollars in health benefits, and to save 230,000 lives in that year alone.[59] Among the Act's core provisions are establishing national health-based ambient air quality standards for pollutants and mandating the application of pollution-control technology to reduce air pollution.

Recognizing the threat of air pollution from sources on the outer continental shelf, Congress amended the Clean Air Act in 1990 to include a new provision, section 328, that mandates "requirements to control air pollution from Outer Continental Shelf sources located offshore of the United States."[60] OCS sources include equipment and activities that emit any air pollutant, are regulated under the Outer Continental Shelf Lands Act, and are located on waters above the outer continental shelf, specifically including drill ship exploration.[61] Section 328 requires EPA to ensure that the offshore pollution does not cause violations of the national ambient air quality standards (NAAQS) and to ensure that OCS sources comply with the PSD provisions of the Clean Air Act.[62]

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[57] *See id.* at 20 (stating that "[t]he Arctic is more sensitive to black carbon that can be transported into the region").
[58] Hirdman et al., Source identification of short-lived air pollutants in the Arctic using statistical analysis of measurement data and particle dispersion model output, 10 Atmos. Chem. Phys. 669 (Jan. 2010).
[59] *See* EPA, The Benefits and Costs of the Clean Air Act from 1990 to 2020 (Mar. 2011), *available at* http://www.epa.gov/air/sect812/feb11/fullreport.pdf.
[60] 42 U.S.C. § 7627(a)(1).
[61] *Id.* § 7627(a)(4)(C).

As the name suggests, the PSD program is intended to prevent existing air quality levels from deteriorating. Its provisions, therefore, seek to protect public health and welfare from the adverse effects of air pollution and to ensure "that economic growth will occur in a manner consistent with the preservation of existing clean air resources."[63] Motivated by a concern that air pollutants could have serious harmful effects to health even at concentrations below primary ambient air quality standards, Congress adopted the PSD provisions, which embody "a policy of maximum practicable protection of health."[64] When adopting the PSD provisions, Congress made clear that practices that "squander[] finite air resources, thereby limiting the potential for long-term economic growth" are contrary to the national interest as reflected in the PSD program.[65] Accordingly, the PSD provisions also "assure that any decision to permit increased air pollution . . . is made only after careful evaluation of all the consequences of such a decision and after adequate procedural opportunities for informed public participation in the decisionmaking process."[66]

A central provision of the PSD program is the requirement that, prior to constructing any "major emitting facility," an applicant must obtain a permit from EPA.[67] To obtain a PSD permit, the owner or operator of a proposed major emitting facility must demonstrate that emissions from construction or operation of the facility will not cause or contribute to a violation of any NAAQS or other applicable emission standard and must conduct monitoring as necessary to determine the effect of emissions on air quality.[68] Emissions from the proposed facility also will be "subject to the best available control technology for each pollutant subject to regulation . . . emitted from, or which results from, such facility."[69] EPA has defined "best available control technology" or BACT to mean "an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation . . . ."[70]

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[62] *Id.* § 7627(a)(1) (requiring compliance with "part C of subchapter I" of the Act).
[63] *Id.* §§ 7470(1), (3).
[64] H.R. Rep. 95-294, at 105-127 (1978) *reprinted in* 1978 U.S.C.C.A.N. 1077, 1183-1205, 1206; *see also id.* at 105-127, *reprinted in* 1978 U.S.C.C.A.N. at 1183-1206.
[65] H.R. Rep. 95-294, at 152, *reprinted in* 1978 U.S.C.C.A.N. at 1231.
[66] 42 U.S.C. § 7470(5).
[67] *Id.* § 7475(a)(1).

Thus, the PSD program has two primary mechanisms for achieving its goals: first, it ensures that air quality standards are met, and second, it requires the application of best available control technology to the source's emissions. The application of BACT ensures that pollution levels generated by the source will not only meet air quality standards, but will remain as low as possible.

Public participation is also central to the PSD program. The statute directs EPA to "assure that any decision to permit increased air pollution . . . is made only . . . after adequate procedural opportunities for informed public participation in the decisionmaking process."[71] The remoteness of the Arctic and its communities—which are not connected to the road system and can be reached only by plane or boat and only when weather permits—presents challenges to the public process. Language barriers and the schedules of a subsistence life can present further challenges. However, public participation is particularly important in the context of Arctic offshore drilling decisions. The indigenous Alaska Native communities along the coast of Arctic Ocean will bear a vastly disproportionate burden of the harmful effects of offshore oil drilling. Not only may offshore drilling expose these communities to direct health risks from air pollution, it may indirectly affect health by putting at risk the subsistence resources that are central to these communities' way of life. The Clean Air Act's PSD program mandates that these disproportionately affected Inupiat communities be provided a meaningful opportunity to participate in offshore permitting decisions. Basic requirements of environmental justice echo this obligation.[72]

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[68] *Id.* §§ 7475(a)(3), (a)(7).
[69] *Id.* § 7475(a)(4).
[70] 40 C.F.R. § 52.21(b)(12).
[71] 42 U.S.C. § 7470(5).

An integral part of the public process accompanying the issuance of air permits to major new sources of pollution is the opportunity to request a review of the permit decision, which in the case of the Arctic Ocean issues from EPA's Region 10 offices, by the Environmental Appeals Board in Washington, D.C. The EAB is an administrative review body that serves as the final EPA decision-maker for permits its is asked to review. The Board consists of nine experienced attorneys who are experts in the Clean Air Act and other statutes the Board oversees. When a permit is appealed to the EAB, panels of three administrative judges typically adjudicate the appeal. Under the EPA's implementation of the PSD program, any person who filed comments on that draft permit or participated in the public hearing may petition the EAB to review any condition of the permit decision.[73] This is an important element of the public participation process, because it offers persons who are affected by the permitted air pollution an avenue of redress short of expensive and time-consuming litigation in Article III courts. Appeals to the EAB are adjudicated by administrative judges that are experts in the complex statutes they administer. They are typically able to adjudicate appeals in several months.

The importance of EAB review is well illustrated by a recent challenge brought by the Alaska Eskimo Whaling Commission and the Inupiat Community of the Arctic Slope against PSD permits issued by EPA to Shell Oil for drilling in the Beaufort and Chukchi seas.[74]

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[72] Executive Order No. 12,898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 Fed. Reg. 7,629, 7,632-33 (Feb. 11, 1994).

[73] 40 C.F.R. § 124.19(a).

[74] *In re Shell*, OCS Appeal Nos. 10-01 through 10-04 at 69, 63-81.

Concurrent with EPA Region 10's consideration of Shell's PSD permit applications, EPA decided to implement new health-based ambient air quality standards for nitrogen oxides (NO_2). In July, 2009, the agency proposed these new standards based on a review of the "substantial amount of new research . . . conducted since the last review of the NO_2 NAAQS," including new information from epidemiologic studies regarding the health effects of exposure to NO_2, that showed that the current annual NO_2 NAAQS was no longer sufficient by itself to protect the public health within an adequate margin of safety.[75] EPA finalized the new short-term standard in February, 2010, to take effect April 12, 2010.[76] EPA Region 10 issued the Shell PSD permits just days before new health standards for short-term exposure to nitrogen oxides took effect, on March 31 and April 9, 2010.[77] In addition to not requiring Shell to comply with these new health standards, EPA Region 10 also failed to consider the standards, and the new studies underlying them, in analyzing the disproportionate effects of Shell's pollution on the Arctic's Inupiat communities. Rather, it concluded that, because Shell's drilling would comply with the annual NO_2 NAAQS—the standard EPA specifically determined did *not* adequately protect human health—the drilling would not disproportionately affect coastal Alaska Native communities. It took an appeal to the EAB to rectify Region 10's violation of its basic duty to conduct a rational analysis of the potentially disparate health impacts to Inupiat communities of the Shell drilling it proposed to permit.[78] Similarly, under pressure from Shell during the permitting process, EPA's Region 10 completely shifted course on its definition of when Shell's drill ship becomes a stationary source for purposes of regulation. As the EAB described in reviewing and remanding the permit, the Region "abdicate[d] to Shell" the agency's regulatory responsibility.[79]

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[75] Proposed Rule, Primary National Ambient Air Quality Standards for Nitrogen Dioxide, 74 Fed. Reg. 34,4404, 34,407 (July 15, 2009); *see also id.* at 34,427 ("[T]he Administrator concludes that the current NO_2 standard does not provide the requisite degree of protection for public health against adverse effects associated with short-term exposures."), 34,439 ("[T]he Administrator proposes that the current annual standard is not requisite to protect public health with an adequate margin of safety.").

[76] Final Rule, Primary National Ambient Air Quality Standards for Nitrogen Dioxide, 75 Fed. Reg. 6,474, 6,474 (Feb. 9, 2010).

[77] *In re Shell*, OCS Appeal Nos. 10-01 through 10-04 at 69, 63-81.

IV. THE COMMITTEE SHOULD REJECT THE BILL UNDER CONSIDERATION TODAY

The bill under consideration today attempts to curtail the EPA's authority under the Clean Air Act to regulate air pollution from offshore oil drilling and to limit the public's participation in decisions that directly affect its health. This bill specifically targets offshore drilling in the Arctic Ocean, [80] and it weakens the Clean Air Act in ways Shell Oil Company has specifically requested. It is a transparent giveaway to Shell with potentially wide-ranging consequences for the health of coastal communities, our oceans, and our climate. The bill should be rejected.

First, the bill attempts to exempt offshore oil companies from complying with a central tenet of the Clean Air Act—ensuring that pollution does not compromise health-based national ambient air quality standards. Currently, compliance with the NAAQS requirement is measured at the source for offshore drill ships, just as it is for all other polluters. Section 2 of the bill seeks to amend Section 328 of the Clean Air Act to relax the requirement so that the air quality impact of pollution from offshore sources is measured not at its source but only at the shore, which can be many miles from the source. It would thus treat offshore sources differently than onshore sources by potentially allowing them to emit pollution at levels that compromise health-based air quality requirements at the drill site. Offshore oil companies would be allowed to emit larger amounts of pollution, causing a greater threat to the air quality of coastal communities. Requiring a shoreline-only look at pollution is also particularly ill-suited for the Arctic Ocean. As described above, subsistence hunting and fishing is centrally important to the Inupiat people, and residents of Arctic Ocean coastal communities spend significant amounts of time on the ocean engaging in whaling and hunting. The Committee should not allow these residents to be exposed to harmful pollution while engaging in these activities.

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[78] *Id.*; *see also* Exec. Order 12,898, 59 Fed. Reg. 7629, 7629 (Feb. 11, 1994) ("Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations" requiring that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations").

[79] *In re Shell*, OCS Appeal Nos. 10-01 through 10-04 at 59.

[80] It amends subsection a of Section 328 that applies to the Arctic, Atlantic, Pacific, and eastern Gulf of Mexico off the Florida Coast. A different provision of Section 328—subsection (b)— that is not amended by this bill applies to the western Gulf.

Second, the bill seeks to amend Section 328 of the Clean Air Act to weaken air emissions controls for offshore drilling. Section 3 of the bill seeks to exempt associated vessels, such as ice-breakers that accompany Arctic Ocean offshore drilling, from the PSD program's protection of air quality and imposition of control technology requirements. One of the central protections of the PSD program is the application of best available control technology. As described above, ice-breakers can account for much of the pollution from Arctic Ocean offshore drilling operations. They can emit large amounts of nitrogen oxide (NO_2) and fine particulate matter ($PM_{2.5}$). In Shell's proposed 2010 operations, for example, ice-breakers accounted for between 75 and 96 percent of the pollutants emitted by Shell's operations.[81] Indeed, for its proposed 2010 drilling operations, it was emissions from Shell's ice-breakers, not emissions from the drill ship itself, that triggered the application of the PSD program to Shell's drilling operations.[82] The bill under consideration would exempt those associated-vessel emissions—the lions share of emissions from offshore drilling in the Arctic Ocean—from technology control requirements. Thus, the largest sources of pollution from offshore drilling would be exempted from applying a central requirement of the PSD program, the application of the best available control technology to reduce pollution.[83]

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[81] Chukchi Statement of Basis, App. A at A-1.
[82] *Id.*

Section 3 of the bill would also amend the Clean Air Act to postpone regulation of offshore drilling operations until the last possible moment. It would do so by defining the time at which a drill ship or platform becomes a stationary source, and thus is subject to regulation, as when drilling commences. This would exempt from regulation under the PSD program all pollution generated from the time the drill ship reaches the drill site until the time it commences drilling. It would also cede to the regulated entity, the oil company, the decision about when its operations must start to comply with the Clean Air Act.

Both of the changes in Section 3 changes are specifically designed to address issue that concern Shell. Shell raised these issues during the review of permits for its planned 2010 Arctic Ocean drilling.[84] During that process, Shell argued, successfully, that it should not have to apply best available control technology to its ice-breakers and associated vessels. This bill would enshrine Shell's position in the statute. Shell also argued, unsuccessfully, that the Clean Air Act's PSD requirements should not apply to its operations until it determined that its drill ship was ready to drill. This bill would enshrine that position in statute.

Section 4 of the bill seeks to limit public participation in decisions about pollution from offshore drilling. Subsection (1) attempts to require an air permit application for offshore drilling to be granted or denied within six months of EPA's receipt of a completed application. Subsection (2) seeks to limit judicial review of permit decisions to the District of Columbia

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[83] The bill would not alter the requirement that emissions from the associated vessels when they are within 25 miles of the drill ship be counted (i) for purposes of determining whether the source is subject to the PSD program and (ii) to ensure that the drilling operations meet air quality standards.

[84] The Board upheld EPA's current interpretation of Section 328 to exempt associated vessels from the BACT requirements of the PSD program. It remanded to EPA its determination of when Shell's drill ship becomes a stationary source for purposes of regulation.

Circuit Court of Appeals. Subsection (3) seeks to preclude administrative review of permitting decisions for all but permit applicants (oil companies), which could file petitions for administrative reconsideration. The curtailment of public participation is particularly troubling in the context of the Arctic Ocean. As described above, many of the communities most directly affected by Arctic Ocean offshore drilling decisions are remote, unconnected to the road system, and contain members for whom English is a secondary language. Many of the communities are predominantly Inupiat, and they engage in a subsistence lifestyle that depends on a clean environment. These communities, moreover, will bear a vastly disproportionate burden of pollution from offshore drilling. If anything, these communities should be given more time and more opportunities to engage in meaningful participation with EPA about decisions that directly and disproportionately affect them. Instead, this bill strips them of those rights.

Again, this section of the bill is designed with Shell in mind. Shell has often repeated the refrain that regulatory delays in the permitting process, particularly at EPA, have prevented it from drilling in the Arctic Ocean. However, Shell itself is to blame for the delays about which it complains. Shell had every opportunity to go about obtaining its permits in the right way. Instead, it continually tried to take shortcuts that avoided, and overstepped, the bounds of the Clean Air Act. As described above, Shell initially attempted to obtain only minor source air pollution permits for its drilling in 2007, arguing that EPA should treat Shell's drill-ships' operations as separate stationary sources, rather than a single source, and thereby exempt the operations from the PSD requirements. In 2008, Shell again tried to obtain a minor source permit for its operations. In 2009, when Shell finally decided to apply for major source permits, Shell again tried to take shortcuts. As described above, Shell insisted on a permit definition of when its drillship becomes a stationary source that essentially allowed Shell itself to determine the time at which its ship's emissions commenced to be regulated under the Clean Air Act. It limited the vessels to which emissions control technology applies. It limited its compliance with emerging new health standards. It provided less air quality monitoring data than is usually required. Inupiat communities and conservation groups have repeatedly been forced to request EAB review of these permits because of Shell's shortcuts, and the EAB has repeatedly found those shortcuts to be unlawful.

Nor, contrary to Shell's public statement, were delays in obtaining an air permit to blame for Shell's decision in February of this year to voluntarily withdraw its plans to drill in the Beaufort Sea in 2011. At the time, Shell was still relying on a pre-*Deepwater Horizon* oil spill response plan. It also still required a host of permits and authorizations in addition to EPA air permits before it could drill in 2011, including a revised exploration plan under the Outer Continental Shelf Lands Act from BOEMRE, permits from the National Marine Fisheries Service and the U.S. Fish and Wildlife Service under the Marine Mammal Protection Act to incidentally harass marine mammals, and ocean discharge permits under the National Pollution Discharge Elimination System from EPA. At the time it cancelled its drilling plans, Shell had not even submitted applications for some of these permits.

V. CONGRESS SHOULD FOCUS ON FACILITATING AN ALTERNATIVE ENERGY FUTURE NOT ON CREATING LOOPHOLES FOR OFFSHORE OIL DRILLING

Rather than considering legislation that exempts offshore oil drilling from the health and environmental protections of the Clean Air Act, Congress should focus its attention on facilitating an alternative energy future. Continued reliance on fossil fuels means higher and higher energy costs for consumers. To ensure reliable and affordable energy for the United States, we should diversify our sources of energy. While any oil discovered in the Arctic Ocean would take years, perhaps decades, to develop and bring to market, committing to alternative energy now can yield significant energy dividends in a relatively short time.

Alaska itself provides an excellent an example of the possibilities afforded by investing in renewable energy. Residents of Alaska's villages, many of which are not connected to the road system, already pay on average four to five times more than what urban Alaskans pay for power. However, there are many villages that could utilize small wind turbines and implement efficiency measures, such as better insulating houses, to reduce their diesel consumption. On a larger scale, modest reductions can have dramatic effects. Just a 10 percent reduction of petroleum consumption, for example, could remove the demand for nearly 2 million barrels of oil per day from the oil market, which could lower the price of gas much more quickly than the decades required for new oil reserves in the Arctic Ocean to come on-line. Besides lowering the price of gas, conservation efforts would improve our balance of payments, reduce our reliance on foreign sources of oil, and lower our emissions of carbon dioxide to the atmosphere. They would slow both global warming and ocean acidification, set a compelling example to the rest of the world, and preclude placing the last great biological strongholds in jeopardy from oil pollution. These renewable and efficiency initiatives can provide jobs and money to the State of Alaska. Congress has a critical role to play in this transition, and it must demonstrate the will and leadership to accomplish these goals.

Mr. WHITFIELD. Thank you. Mr. Meyers, you are recognized for 5 minutes.

STATEMENT OF ROBERT J. MEYERS

Mr. MEYERS. Thank you, Mr. Chairman, members of the committee. I appreciate the opportunity to testify.

As with any sort of matter of this nature, I think it is first appropriate to look at the legislative history of this provision. My written testimony contains some of that. I don't pretend that is comprehensive. But with respect to where 328 came from, there was precursor legislation in the House and the Senate. These bills seem to basically have been addressing situations off the coast of California in the 1970s and 1980s. And we are focused primarily with respect to the onshore impact of the emissions.

But in any event, when we look at the history here, Congress settled the issue of how it wanted to regulate OCS sources through enactment of Section 328 of the Clean Air Act. Now, you know, in one sense, I think that is what Congress intended to do in the Clean Air Act, but this testimony you have received otherwise. I think it is clear that the matter seems to be very unsettled. Various interpretations with regard to the Clean Air Act have been offered up to the regional office. Various interpretations of the Clean Air Act have been offered up to the EAB, and EAB has issued a very lengthy opinion on the same. So I would emphasize, too, that under the process that EPA is following right now, the permit at issue here for the litigation—or potential litigation I suppose—would be the Frontier Discoverer. And that is not considered to be final.

But, you know, I think this situation stands in stark contrast to what Congress and EPA seemingly intended by enactment of Section 328 in the first place where if you look at EPA's OCS regulations, right in the beginning they state, "In implementing, enforcing, and revising the OCS rule and in delegating authority hereunder, the Administrator will ensure that there is a rational relationship to the attainment and maintenance of federal and state ambient air quality standards and the requirements, and that the rule is not used for the purpose of preventing exploration and development of the OCS." This is in the EPA regulatory text.

In proposing the OCS regulations in 1991, EPA stated that it intends that the OCS rule will result in "a more orderly, less burdensome system of air quality permitting process for OCS sources." This may certainly speed up the permitting process, which may reduce costs in some instances, particularly offsetting the additional cost associated with the rule's more stringent requirements for controls and offsets. I think the fact that it has taken years to decide matters concerning the operation of drilling ships in the Arctic demonstrates that EPA's intentions at a minimum have not been fulfilled.

My written testimony also recounts the various efforts under Title II of the Clean Air Act regarding the control of emissions from marine vessels. As my testimony recounts, EPA has been aggressively addressing such emissions for over a decade and will continue to implement standards and new fuel requirements over the next decade. These regulations did not exist in 1990 when Congress enacted 328 and represented significant change to the circumstances from those that Congress sought to address. These regulations affect all classes of marine vessels. These regulations affect new vessels and remanufactured vessels. These regulations affect fuel sulfur levels that are used. And the U.S. has further—as I point out in my testimony—entered into international negotiations with respect to the control of fuel off the coastline. All these factors are new, all these factors did not exist in the 1990s, and all these factors will affect vessels.

With regard to the discussion draft, the legislation essentially has three substantive sections. With regard to air quality measurement, it adds a specification that the air quality impact of an OCS source will be measured with respect to the correspondent onshore area. My interpretation of this is that it is consistent with the language and legislative history of the Clean Air Act. Now, I know that has been a matter of contention in terms of the current permit, but I think it maintains the proper focus of NAAQS, which has been with regard to primary NAAQS, a focus on protection of public health with an adequate margin of safety.

Now, with respect to the OCS source definition, the section provides that direct emissions of vessels servicing an OCS source shall be "counted" but shall not be basically subject as a stationary source under the PSD program. I think I would fundamentally disagree that the Clean Air Act requires that vessels install BACT. This position does not appear in the legislation. This position, in fact—in the EAB decision with regard to the Frontier Discoverer permit—the EAB agreed that vessels are not within this. This decision is also reflected in the 1991 regulations.

And then finally, just with regard to the EAB itself, as I note in a footnote in my testimony, I would point out that the Agency considers that the existing statutory deadlines in the Clean Air Act do not apply when the EAB is considering a permit.

[The prepared statement of Mr. Meyers follows:]

Testimony of Robert J. Meyers
Subcommittee on Energy and Power
House Energy and Commerce Committee
April 13, 2011

I would like to thank the Chairman of the Subcommittee, Mr. Whitfield, for the opportunity to testify concerning The Jobs and Energy Permitting Act of 2011. This Subcommittee and the full Energy and Commerce Committee has a long history of conducting in-depth hearings into the Clean Air Act ("CAA") and its implementation and I appreciate the opportunity to share information on the background of CAA provisions affecting drilling activity on the Outer Continental Shelf ("OCS") and how the pending Discussion Draft would amend current CAA requirements.

As Members may know, my law firm, Crowell & Moring LLP represents affiliates of Shell Oil Company that are seeking CAA permits for exploration drilling projects to be conducted offshore Alaska in the Beaufort and Chukchi Seas where Shell holds offshore oil and gas leases. I want to emphasize, however, that the views I am expressing today are my own and not necessarily those of Shell and that I am testifying today on my own behalf and not as a Shell representative.

As with any matter of this nature, it is desirable to first outline the background and legislative history of the underlying CAA provision. Following this discussion, I will briefly outline the major CAA provisions involved: National Ambient Air Quality Standards

("NAAQS") and CAA permitting provisions. Finally, I will offer an assessment of the impact of the Discussion Draft on CAA section 328 and final permit decisions made under that authority.

I. Background on CAA Section 328

Section 328 of the CAA was enacted as part of the 1990 Clean Air Act Amendments ("1990 CAAA").[1] It was located in Title III of the Clean Air Act, which contains general provisions related to the operation of EPA, definitions applicable throughout the CAA, citizen suit provisions, administrative proceedings, judicial review, air quality monitoring and modeling and other separate, mostly self-contained provisions.

While section 328 was somewhat "buried" in the 1990 CAAA, it was not a product of last-minute decisionmaking. Instead, the origins of the legislation go back several years prior to the time that Congress considered the House and Senate bills that eventually became the 1990 CAAA. While I have not conducted extensive research on this issue, legislation to address OCS air emissions through the CAA was introduced at least by 1987.[2] The former Health and Environment Subcommittee conducted several hearings on this matter. As part of the broad series of hearings conducted on reauthorization of the CAA, the subcommittee received testimony on the regulation of air emissions on the OCS in conjunction with its consideration of other bills that had been introduced to revise CAA provisions affecting the implementation of national ambient air quality standards ("NAAQS").[3]

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[1] Pub. Law 101-549.

[2] H.R. 2521 was introduced by Representative Levine of California on May 27, 1987. This legislation amended the CAA to regulate both stationary OCS sources and vessels "engaged in activity regulated or authorized under the Outer Continental Shelf Lands Act or engaged in oil or gas exploration" among other provisions. The bill required the use of Lowest Achievable Emission Rate (LAER) technology and sought to address both new and existing sources.

This is, perhaps, not surprising. During the 1970s and 1980s, considerable public attention was paid to drilling activity off the coast of California and matters concerning the permitting of facilities were often contentious. While attention was focused on a range of issues, it is clear that the impact of OCS sources on air quality primarily focused on onshore air quality. At the time, California needed to address the requirements of the 1970 Clean Air Act and the 1977 Clean Air Act Amendments. The state was far from meeting the former 1-hour ozone NAAQS despite the imposition of multiple state regulations. Therefore, California was confronted with a range of issues with respect to developing an appropriate state implementation plan ("SIP") to demonstrate how the state could come into compliance with NAAQS.

At this time, litigation also occurred with respect to what part of the federal government held authority to regulate air emissions on the OCS.[4] Within the federal government, there were also several interagency exchanges between the Environmental Protection Agency ("EPA") and the Department of Interior ("DOI") on how regulation should occur and whether CAA provisions were applicable to this activity.[5]

In the context of the 1990 CAAA, legislative language to address OCS sources was offered in an amendment in the nature of a substitute offered by Senate Majority Leader George

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[3] *See* H.Rpts. 100-129 and 100-130 (September 23, 28, and 29, 1987).

[4] *State of California v. Kleppe*, 604 F.2d 1187 (1979).

[5] For example, EPA filed comments on a 1978 DOI Advance Notice of Proposed Rulemaking and the Agency took further actions to require California to include OCS emissions within its state implementation plan.

Mitchell on March 5, 1990 to S. 1630, the Senate's version of the 1990 CAAA. This amendment specifically referenced "severe and unique air quality problems in California" and required the Secretary of the Interior to promulgate regulations under the [Outer Continental Shelf Lands Act, or OCSLA[6]] to limit "emissions of air pollutants from OCS activities in the area adjacent to California." This general legislative direction, however, was conditioned by the amendment's prohibition that any technology must be "feasible" and not "cause an unreasonable threat to health and safety." Under the Mitchell legislation, EPA was to delineate OCS air districts on the basis of their location relative to adjacent onshore air districts. For areas outside of California, DOI was to consult with EPA to assure the coordination of air pollution control regulation and complete a study of such emissions, thereafter determining whether additional actions would be necessary.

In the House version of the 1990 CAAA (S. 1630 as passed by the House on May 25, 1990) section 712 required the EPA Administrator to establish regulations following consultation with the Secretary of the Interior and the U.S. Coast Guard "to control air pollution from Outer Continental Shelf sources located offshore of the States along the Pacific, Arctic and Atlantic Coasts and along the United States Gulf Coast off the State of Florida eastward of longitude 87 degrees and 30 minutes . . ." The House legislation was therefore much broader than the Mitchell amendment. In addition to conveying regulatory authority to EPA, the legislation included an exemption process and a process by which states could submit regulations to EPA for enforcement and delegation of authority to the States. Altogether, as reflected in the current text of CAA section 328, the House legislation prevailed in conference with the Senate and was largely adopted in the final 1990 CAAA.

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[6] 67 Stat. 462.

Through enactment of CAA section 328, Congress conferred on EPA primary authority to address air emissions from sources located on the OCS for all but the offshore areas of four states – Texas, Louisiana, Mississippi and Alabama.[7] Previously, DOI had acted under the authority conveyed to the department though OCLSA to address air emissions on the OCS and other environmental impacts. This law required DOI to promulgate regulations to protect NAAQS;[8] DOI promulgated such regulations in 1980 and still has authority under OCSLA to regulate OCS sources engaged in oil and gas exploration and production with regard to onshore air quality impacts and the maintenance of NAAQS.[9]

In 1989, DOI had published a further notice of proposed regulations to address OCS activities off the coast of California.[10] Enactment of the 1990 CAAA, however, effectively cut this effort short. While DOI regulations and primary regulatory authority remained in place in the Western Gulf of Mexico, where the large bulk of offshore drilling activity had historically taken place (and continue to give DOI a role in air quality regulation in all OCS areas) the 1990 CAAA granted EPA primary authority with respect to all other offshore areas of the United States. It is notable that, unlike other existing CAA programs that were amended or expanded within the context of the 1990 CAAA, EPA authority in this area was entirely new.

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[7] The transfer of authority to EPA specifically exempted these States, requiring instead that the Secretary of the Department of Interior consult with EPA to assure coordination of air pollution control regulation for the OCS. *See* 42 U.S.C. § 7627 (b).

[8] The OCSLA was originally enacted in 1953, but has been amended several times. Amendments enacted in 1978 (Public Law 93-627) clarified the authority of DOI regarding the regulation of OCS air emissions and contained requirements for the promulgation of rules to address NAAQS.

[9] DOI regulations provide for evaluation of air quality impacts of oil and gas exploration activities as part of DOI review of plans for exploration and development of offshore oil and gas leases. However, DOI issued a "notice to lessees" in the fall of 2009 stating that "The MMS air quality regulations in 30 CFR 250.302, 303 and 304 . . . no longer apply to air emission sources in OCS areas where EPA has jurisdiction." NTL 2009-11.

[10] EPA's proposed regulations to implement Section 328 contain a detailed history of DOI rulemaking activity under the OCSLA, including interaction between EPA and DOI during the 1980s regarding accounting for the impact of OCS emissions onshore. *See* 56 Fed. Reg. 63,774, 63,775-7 (December 5, 1991).

II. CAA Regulations Affecting OCS

In late 1991, acting under its new CAA authority, EPA proposed OCS regulations. The Agency finalized the regulations in 1992,[11] making the regulations one of the first actions that EPA took following enactment of the 1990 CAAA.[12] The regulations provide procedures for implementing and enforcing CAA standards, specifically NAAQS and the Prevention of Significant Deterioration ("PSD") requirements.

In this regard, NAAQS currently exist for six ambient air pollutants – ozone, particulate matter, nitrogen dioxide, sulfur dioxide, carbon monoxide and lead. NAAQS are established through a process provided for in CAA sections 108 and 109. "Primary" NAAQS are to set a level that is requisite to protect public health; "secondary" NAAQS are to be established at a level requisite to protect the public welfare.[13] The CAA provides for review and assessment of NAAQS every 5 years; States are primarily responsible for their implementation and must develop detailed SIPs which can both demonstrate attainment of the standards by applicable deadlines and the state's legal ability and plans on how it will reach attainment.

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[11] 57 Fed. Reg. 40,794 (September 4, 1992).

[12] As noted in the 1995 report by the Congressional Research Service, "It has been estimated that the Clean Air Act Amendments of 1990 required EPA (sometimes in conjunction with other agencies) to issue some 175 new regulations, write more than 30 guidance documents, conduct some 50 research efforts, prepare 25 reports to Congress, and create 7 panels. This involves reviewing and revising many existing rules and guidelines as well as developing new programs for which notices, new rules, and guidelines will be needed. Despite increases in EPA's budget for CAA implementation, the adjustment period following passage of the 1990 amendments was slow. Many actions were delayed while the Agency hired new staff and adapted to the ambitious pace of the new rulemaking schedule. Early delays ultimately affected the Agency's ability to conduct its business according to statutory schedules." Implementing the Clean Air Act Amendments of 1990: Where Are We Now? CRS Report 95-234 (January 30, 1995).

The PSD program requires that new and certain modified sources obtain preconstruction permits; a permit is required before the source can commence construction or a major modification of a facility. PSD also requires that certain analysis be conducted with respect to the air quality impact of a source and that a public hearing be held with the opportunity for comment. With respect to the control requirements that are applicable to a source that "triggers" PSD, CAA section 165(a)(4) provides that a proposed facility is subject to "best available control technology" ("BACT"). Under several Agency guidance documents, BACT has been applied on a case-by-case basis by various permitting agencies, based on a "top-down" assessment of available technology.

The task in front of EPA in 1991 and 1992 – and indeed today – is how such CAA NAAQS and PSD requirements, borne of a concern to address localized and regional air pollution, should be interpreted in the context of CAA section 328. Various OCS sources, including drilling ships and other vessels, may operate only sporadically off the U.S. coastline intermittently as stationary sources. Unlike stationary sources, drilling ships involved in exploration activities may shift locations and operate in areas like the Arctic which seriously constrain the amount of time they may remain in one location.

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[13] "Public welfare" is separately defined in the CAA under section 302(h) (42 U.S.C. § 7602(h)) and is to include effects on soils, water, crops, vegetation and many other parameters.

To a certain extent, current EPA regulations recognize this difference. EPA's OCS regulations provide that, "In implementing, enforcing and revising [the OCS rule] and in delegating authority hereunder, the Administrator will ensure that there is a *rational relationship to the attainment and maintenance of Federal and State ambient air quality standards* and the requirements of [the PSD program], and *that the rule is not used for the purpose of preventing exploration and development of the OCS.*" (Emphasis added). Thus, at least with reference to its statutory authority and the scope of its regulatory authority, EPA has adopted the posture that CAA requirements need to be considered in the context of exploration and development of the OCS. In addition, it should be noted that the logical, natural and historic focus on NAAQS and PSD is with respect to land-based sources and ambient air quality. This supports the interpretation that the focus on OCS requirements is onshore, i.e., that onshore air quality represents a "rational relationship" between OCS sources and attaining and maintaining air quality standards.

Apart from the statement of scope and purpose, EPA's OCS regulations serve to "flesh out" the requirements established by enactment of CAA section 238. The regulations provide definitions for an "OCS source," contain requirements for the submittal of a "Notice of Intent" prior to the submittal of an application for a preconstruction permit, provide a process for defining relevant onshore areas, contain requirements relating to permit applications and the administrative procedures used to consider such applications, contain provisions for the delegation of authority from the Administrator to implement the OCS permitting requirements, include separate requirements for sources located within 25 miles of a State shoreline and those outside of this distance, contain provisions for the exemptions of sources and address CAA offset requirements, monitoring and reporting requirements, enforcement provisions and fee requirements.[14] The regulations also reference state requirements for application of requirements within 25 miles of a state's boundaries and list state and local requirements incorporated by reference.

III. EPA Mobile Source Regulations

When considering drilling activities on the OCS, it is also relevant to consider that EPA regulates emissions from mobile sources, using authority that Congress conveyed to the Agency in Title II of the CAA. Under the CAA, EPA has authority with respect to "nonroad" engines and vehicles. The CAA defines a "nonroad vehicle" quite simply as a vehicle powered by a nonroad engine that is not a motor vehicle (i.e., a vehicle that is self-propelled and designed for street or highway use).[15] Thus, marine vessels, locomotives and other non-highway vehicles are considered to be "nonroad" vehicles subject to EPA's authority to establish regulations under CAA section 213. Under this section, nonroad standards are to provide for the "greatest degree of emission reduction achievable through the application of technology which the Administrator determines will be available . . . giving appropriate consideration to the cost of apply such technology within the period of time available to manufacturers and to noise, energy, and safety factors associated with the application of such technology."

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[14] Outer Continental Shelf Regulations can be found at 40 C.F.R. § 55.1-15.

[15] CAA section 216 (2) and (10)-(11).

Using this authority and other Title II authorities (most particularly those authorities related to fuel), EPA has developed several rounds of nonroad regulations focused on marine vessels since enactment of the 1990 CAAA. EPA established standards for large ocean-going vessels at or above 30 liters per cylinder displacement (called "Category 3" vessels) through final regulations in 2003 and 2010.[16] These regulations will require an 80 percent reduction in emissions of nitrogen oxides (NOx) in 2016 through the use of engine controls and requirements to utilize lower sulfur fuel in U.S. waters.[17] The standards will apply to newly built engines in 2011 and contain more aggressive longer-term standards that require the use of selective catalytic reduction units in 2016.

Smaller vessels, known as "Category 1" and "Category 2" vessels were addressed in EPA regulations promulgated in 2008.[18] These engines range in size from 800 to 11,000 horsepower and generally include vessels like tugboats, supply vessels, fishing vessels and commercial vessels in use in and around U.S. ports.[19] The 2008 regulations apply to both newly manufactured engines and when engines are "remanufactured." For larger marine engines of this type, EPA's "pulled ahead" Tier 4 nitrogen dioxide ("NO_x") standards by two years, making the regulations effective in 2014. The same vessels were previously subject to regulations EPA promulgated in 1999, standards which EPA described as "requiring substantial reduction in oxides of nitrogen and particulate matter emissions to correspond with the next round of emissions for comparable land-based engines."[20]

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[16] 68 Fed. Reg. 9,745 (February 28, 2003) and 75 Fed. Reg. 22,896 (April 30, 2010).

[17] The regulations impose requirements for the use of 1,000 part per million ("ppm") sulfur diesel. This fuel requirement can represent over a 95% reduction in the sulfur content of fuel currently in use.

[18] 73 Fed. Reg. 25,098 (May 6, 2008).

[19] Recreational vessels were addressed in a separate rulemaking. *See* 67 Fed. Reg. 68,242 (November 8, 2002).

In general, EPA's approach to mobile source regulation has been sequenced with respect to both emission control technology and the time necessary to change fuel specifications. EPA has generally focused on the cost-effectiveness and availability of engine control technologies within various classes of on-road highway and non-road vehicles and has tended to start with the largest categories of emissions first, implementing additional standards over time to address smaller categories. For example, the Agency established final heavy-duty diesel truck standards in 2001, followed by comparable standards for nonroad vehicles and equipment in 2004. The Agency has also linked fuel standards with the promulgation and phase-in of newer on-road and nonroad equipment, phasing out higher sulfur diesel fuel in a timeframe when newer equipment is entering the marketplace.

With respect to marine vessels, the Agency explained this focus in the 2010 Category 3 rulemaking stating that:

> Our coordinated strategy for ocean-going vessels, including the emission standards finalized in this action under the Clean Air Act, continues EPA's program to progressively apply advanced aftertreatment emission control standards to diesel engines and reflects the evolution of this technology from the largest inventory source (highway engines), to land-based nonroad engines, to locomotives and marine diesel engines up to 30 liters per cylinder. The

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[20] 64 Fed. Reg. 73,300 (December 29, 1999).

> results of these forerunner programs are dramatic reductions in NO_x and $PM_{2.5}$ emissions on the order of 80 to 90 percent, which will lead to significant improvements in national air quality.[21]

In addition to regulatory controls on engines and fuels under the CAA, EPA has also pursued actions to create NO_x and fuel sulfur control areas off the coasts of the United States as part of the International Convention for the Prevention of Pollution from Ship (MARPOL Annex IV). Under this convention, the United States and Canada submitted a proposal to the International Maritime Organization ("IMO") for the designation of an emission control area off the coastline of each country. The IMO amended the convention on March 26, 2010, to effectuate the designation.

Altogether then, it is clear that since Congress last acted to amend the CAA and include specific provisions addressing drill ship exploration and emissions from service vessels in CAA section 328, EPA has taken a number of substantial steps to reduce the emissions from vessels over which it has jurisdiction. With respect to vessels that may be flagged in other countries but operate in U.S. waters, the United States has also been an active participant in the MARPOL Annex IV process. Both actions create a substantially different regulatory environment for marine vessels and the fuel consumed by these vessels than the one Congress sought to address in 1990.

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[21] 75 Fed. Reg. at 22,898.

IV. Discussion Draft

The Discussion Draft that is the subject of today's hearing is essentially a "cut and bite" amendment of the existing CAA section 328 provisions. The legislation has three substantive sections affecting air quality measurement, the definition of an OCS source and finalization of Agency action with respect to OCS permit applications.

A. Air Quality Measurement

The Discussion Draft adds the specification that the air quality impact of an OCS source will be measured with respect to the corresponding onshore area. My interpretation is that this legislative language is consistent with the legislative history of the CAA cited above. In essence, the provision clarifies and makes more explicit the fact that Congress, in enacting CAA section 328, was primarily concerned with the impact of OCS sources on the ability of onshore areas to attain and maintain NAAQS standards.

In this regard, it should also be recognized that the CAA provides that primary NAAQS are to be designed to protect "public health." As EPA has noted, the NAAQS statutory framework does not require that a NAAQS be set at a level of zero risk, or be focused on the impact of an air pollutant on sensitive individuals. Instead, the CAA requires NAAQS to be set at a "level that reduces risk sufficient so as to protect public health with an adequate margin of safety."[22] Consistent with the focus of the OCS requirements on NAAQS (and the protection of NAAQS attainment and maintenance through application of the PSD program) it seems not to be a stretch of logic to observe that the general public overwhelming lives and resides onshore.

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[22] *See* for example, 73 Fed. Reg. 66,965, 66,966 (November 12, 2008).

B. OCS Source

This section of the legislation contains two different elements. First, the section provides that although direct emissions of vessels servicing an OCS sources and operating within 25 miles of the OCS source ("associated vessels") shall be "counted" with respect to the assessment of the air quality impact of the OCS source, such vessels when engaged in such activity will not be regulated as stationary sources under the PSD program. Second, the section defines (for platform and drilling ship exploration) specifically when an OCS source is established and when it ceases to exist.

With regard to the first matter, it appears clear from the Congressional consideration of this measure and from EPA's interpretation of section 328 that the focus of the section was to prevent OCS sources from "escaping" CAA regulation by virtue of their offshore location and thereby adversely affecting onshore air quality. This interpretation is supported by the context that led up to the enactment of the section. EPA specifically cited the experience in California in proposing its regulations. The agency stated that California's consideration of OCS involved "a confrontational atmosphere in which the onshore community felt that OCS activity was encouraged at the expense of air quality or economic growth onshore."[23] Thus, CAA section 328 attempted to provide for corresponding regulation of OCS sources based on their "status" as stationary sources (albeit in the case of exploration activities, temporary sources). To this end,

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[23] 56 Fed. Reg. at 63,775. EPA also noted that it "intends that the proposed OCS rule will result in a more orderly, less burdensome system of air quality permitting for OCS sources. This certainty may speed up the permitting process, which may reduce costs in some instances, particularly offsetting the additional costs associated with the rule's more stringent requirements for controls and offset. The proposed rule thus should result in a more stable regulatory atmosphere, allowing companies to plan with greater certainty the amount of time needed to obtain necessary permits to begin construction and operation of OCS sources." Id.

CAA section 328 provides that for sources within 25 miles of a state boundary, the requirements on the OCS source are "the same as requirements that would be applicable if the source were located in the corresponding onshore area ("COA")."[24] The Discussion Draft would serve to further codify this treatment and provide a bright line direction to EPA and state and local permitting authorities with regard to the scope of the BACT review for an OCS source.

The position taken by the legislation is straightforward. That is, just as a truck which drops off or picks up supplies from a factory onshore does not become stationary source by virtue of this activity, the Discussion Draft provides that neither should marine vessels be regulated as a stationary source by virtue of supplying or servicing an OCS source. Both the truck and the marine vessel do not escape regulation under the CAA – they are both subject to the provisions of Title II as outlined above – but the Discussion Draft makes it clear that they do not incur additional CAA regulation simply by the use to which they are put.

The second part of the OCS source provision is to create a test when an OCS source is established and how long it is deemed to exist for purposes of regulating its emissions as a stationary source rather than as a marine vessel. In this regard, the legislation addresses the unique circumstances that are attendant to offshore exploration activities. A drill ship or a platform may move from location to location. Effectively, under the legislation, CAA stationary source requirements would apply only during the time that the ship or platform is engaging in the type of activity which makes it "similar" to a stationary source, i.e., when it is conducting actual drilling activity.

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[24] 56 Fed. Reg. at 63,774.

C. Permit Application

This provision of the legislation would add a new subsection to CAA section 328 to address when final agency action on an OCS permit application is required. The provision also provides that OCS permits will be treated on the same basis as nationally applicable regulations for purposes of judicial review. This would mean that petitions for judicial review of an OCS permit would be centralized for consistency in the United States Court of Appeals for the District of Columbia. The legislation further provides that additional administrative review or adjudication of an OCS permit is not allowed after such six-month period for final agency action unless an applicant files a petition for reconsideration, presumably on the basis that final agency action resulted in denial of a permit or other unfavorable action.

Under section 4 of the Discussion Draft, EPA is allowed 6 months to take action with respect to an OCS permit after the filing of a "completed application." In effect, this allows the Agency less time than is required under the CAA for other PSD permits.[25] However, the provision applies solely to an "OCS source" as defined within section 328 of the CAA. Thus, the provision reflects a policy decision that CAA permitting of OCS sources be streamlined and that Agency resources be devoted to ensuring that completed applications can be promptly acted on by EPA.

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[25] CAA section 165(c) provides that a completed permit application "shall be granted or denied not later than one year after the date of filing of such completed application." EPA has taken the position in litigation, however, that the one-year deadline in the CAA applies only with respect to the actions of the Administrator's "delegate" to make a final permit decision (e.g. the decision of a Regional Administrator with respect to a completed permit application). Under current regulations, an entity cannot begin construction under such a decision until 30 days have passed during which time appeals may be made to the Environmental Appeals Board -- a part of EPA -- by any person who commented on a permit or participated in a public hearing on the permit. Under this process, EPA considers that a permit is not final agency action until the EAB process is complete. Specifically, EPA has stated that a permit decision "becomes final agency action for purposes of appeal to a federal court of appeals only after the administrative appeal process is exhausted." Defendant's Response to Plaintiff's Supplemental Brief Regarding Remedy, *Avenal Power Center, LLC v. EPA*, United States District Court for the District of Columbia (filed 3/1/2011) at 14. This can result in substantial delays in receiving a "final" permit.

V. Conclusion

I appreciate the opportunity to testify before the Subcommittee on this important issue. On the whole, my assessment of the Discussion Draft is that it will serve the purposes that EPA originally outlined for its OCS regulations 20 years ago. That is, the legislation will apply CAA requirements to OCS sources in a clear fashion which recognizes the need for "a more orderly, less burdensome system of air quality permitting for OCS sources." The legislation would also clarify that OCS activities that comply with CAA requirements are a national priority and that air quality impacts of OCS sources should be promptly assessed and addressed within enforceable permits. Additionally, the legislation would reflect the fact that EPA has acted over the last 20 years to aggressively regulate marine diesel emissions from all categories of vessels, thus addressing some of the concerns that prompted the original enactment of CAA section 328. Finally, the judicial review provisions of the legislation would help to ensure that interpretation of relevant CAA requirements is consistently applied across the country in offshore areas that are subject to EPA authority.

Mr. WHITFIELD. I want to thank you, Mr. Meyers, and thank all of you for your testimony.

Mr. Lawrence, what was the date that you all signed for this lease? What day did you acquire this lease?

Mr. LAWRENCE. We have had multiple lease sales. The first one was in 2005. We had a subsequent one in 2007 and then subsequently in 2008. And that was the big one in the Chukchi. At that, Mr. Chairman, we bid record amounts, $2 billion, and we did that because what we saw is the tremendous resource potential.

Mr. WHITFIELD. Now, if you had this air permit issued tomorrow, what would be the time frame for you to start production of oil?

Mr. LAWRENCE. At this point in time, we would be looking at something that would start probably in the middle of the next decade. And I point that out for the following reasons. If we had been allowed to begin at the time that we thought we would start when we received these permits, we had hoped to start at the early part of the next decade or even in this decade.

Mr. WHITFIELD. And if you had the air permit tomorrow, how many additional permits would you have to have before you could start production?

Mr. LAWRENCE. We currently worked right now with 35 permits to be able to work through this, so there is a large amount of coordination between different agencies to be able to do that. We have made satisfactory progress on most of those permits, and we expect that we will be able to work through those. However, there is always a chance that some of those may not come through.

Mr. WHITFIELD. But you need a total of 35 permits?

Mr. LAWRENCE. Thirty-five permits to be able to drill.

Mr. WHITFIELD. Now, it is my understanding, Mr. Meyers or someone on the panel, that this EAB board is not really in the Clean Air statute but was simply created by one of the administrators of EPA. Is that correct?

Mr. LAWRENCE. That is correct. It was created under regulations issued by EPA. It is, in fact, a part of EPA. And so it is a regulatory creation.

Mr. WHITFIELD. OK. Now, Mr. Meyers, would you be able to explain the primary differences between the criteria to issue a permit by the Department of Interior for OCS production and the EPA process?

Mr. MEYERS. Well, the current regulations that DOI apply to require under 1334(a)(8) I believe of the regulations that the DOI apply national ambient air quality standards. With regard to how EPA addresses it, they are acting under authority under 328. And effectively under 328, what they are doing is applying other parts of the act.

If I might parenthetically assert here, I don't read the legislation to exempt the sources from the Clean Air Act. The legislation effectively interprets certain provisions within 328 but it doesn't exempt the OCS source from PSD BACT review. That is maintained.

Mr. WHITFIELD. OK. Ms. Ahtuangaruak, you had mentioned in your testimony that you oppose this legislation. And what particular part do you object to?

Ms. AHTUANGARUAK. The exemptions to industry to allow them to increase the pollutions in our area is that. And also the push to allow industry to move forward with their process for bringing concerns into the right process where we would be limited as local citizens.

Mr. WHITFIELD. But the exemptions—and Mr. Meyers, you said there are no exemptions, is that correct?

Mr. MEYERS. No, it doesn't exempt OCS sources from PSD BACT review.

Mr. WHITFIELD. OK.

Mr. GRAFE. Mr. Chairman, I have an opinion.

Mr. WHITFIELD. Yes, Mr. Grafe?

Mr. GRAFE. Thank you very much. As Mr. Meyers said——

Mr. WHITFIELD. Move your mike.

Mr. GRAFE. As Mr. Meyers said, the provision would still regulate and apply PSD to the OCS source, which you would define as the drillship which produces maybe 2 percent of the pollution from Arctic offshore drilling. Most of the pollution from Arctic offshore drilling comes from the associated vessels, which this particular piece of legislation seeks to exempt from the application and best available control technology and other PSD requirements, as I think——

Mr. WHITFIELD. Do you agree with that, Mr. Meyers?

Mr. MEYERS. They never were included under BACT. They are mobile sources. Title II of the act regulates mobile sources. Marine vessels are non-road sources as I point out in my testimony, I think, this interpretation of the Clean Air Act to say that BACT applies to a mobile source.

Mr. WHITFIELD. OK.

Mr. GRAFE. Your Honor, may I respond?

Mr. WHITFIELD. Yes.

Mr. GRAFE. The Section 328 when it was passed directed that the PSD program be applied to OCS sources and has written when it passed, it said apply PSD and BACT to OCS sources direct emissions from the associated vessels like icebreakers are direct emissions from the OCS source. It would seem odd to determine that, you know, from a policy perspective to look at those emissions when you are determining, well, does the PSD program apply?

Mr. WHITFIELD. My time has expired, but I am assuming you would disagree with that, Mr. Meyers, but just say yes or no.

Mr. MEYERS. Absolutely.

Mr. WHITFIELD. OK. We will meet afterwards and we will get you two together and we will talk about it.

Mr. Rush, you are recognized for 5 minutes.

Mr. RUSH. Mr. Chairman, I might, if I could, remind the committee that this is a Shell operation and the matter that these witnesses are discussing, and it is important that we get the environmental and public health protection right in this instance.

And Mr. Chairman, I want to remind you and other members, especially my Republican friends that might just don't make it right. This bill is designed to help 1 company commence to drill but standards set by this committee would apply to all future offshore projects in the Arctic as well. And Mr. Chairman, I want to again reiterate my concern that if the EPA had been here today as a witness to describe how this bill would affect public health and the environment over the long-term as more oil companies are attempting to drill in the delicate Arctic ecosystem, then we might be further along and we might be able to get this right.

My question is directed to Mr. Grafe. Mr. Grafe, can you speak to the cumulative health impacts of offshore oil and gas drilling as more companies enter the Arctic waters?

Mr. GRAFE. Yes, thank you. Shell is the first one that would be out there, and its pollution alone was significant and taking up very high, up to 70, 80 percent of the allowable increments that you are allowed to sort of add air pollution into the air. And that is just one operator, and there are other operators who have announced plans to attempt to get drilling permits starting soon. And so it is a big problem because one operator is taking up all the space and polluting a whole lot, and as more come, there will be much more pollution.

Mr. RUSH. Ms. Ahtuangaruak, can you talk about some of the impacts that you have seen regarding climate change and air pollution on the ground in the Arctic region?

Ms. AHTUANGARUAK. We are definitely seeing some changes to the Arctic. For us one of the important concerns is whether or not the caribou are going to cross the rivers to get to the calving grounds, whether or not there is going to be appropriate growth of vegetation for the calves that are going to help with their survival rates and their health, whether or not there is enough insects that are produced for the birds when they migrate up for their new growth of their young ones, whether or not there is adequate ice for us to go out and do our traditional cultural activities, under-ice fishing. If we don't have the ice forming the way it is supposed to, we may not get the fish when we want to get them when they are available to us when we can get like before the eggs hatch, those kinds of things; whether or not we are going to have the platforms to bring the whale up onto the ice. Those are all very important concerns. Whether or not we are going to have ice on the shore during the fall storms, those things effect erosion rates along the coast tremendously and it has already caused tremendous problems.

The increased rains are affecting us. We are having tremendous amounts of erosion, especially on the Colville River. There are areas that I have seen over 500 feet eroded in just a few years. It affects the air in general, they way that the particles are in the air, how it affects us and our health. Some of these things have not been well studied. The particulates in our environment are most of the studies are at 70 degrees. We don't have many days at that temperature.

There is a lot of effects that go there. For health concerns, as a health aide when I started, I was taught by our people what is normal. I didn't used to hear a lot of wheezing in patients. I had one person who used an inhaler, but as I continued to work and further my education, I started counting these things. When I came back from PA school, there were 35 people that were having to use medications.

Mr. RUSH. Thank you so very much. We are getting the picture. I want to move on because my time is winding down.

Mr. Grafe, the question is are you opposed to any drilling in the Arctic region and is there any satisfactory level of controls and protection that will satisfy you in terms of drilling in the Arctic region at all?

Mr. GRAFE. We are not against drilling in the Arctic region. We are for the application of environmental laws to that drilling to protect human health and to protect the natural wildlife resources of the region.

Mr. RUSH. Mr. Chairman, I yield back.

Mr. WHITFIELD. Mr. Shimkus, you are recognized for 5 minutes.

Mr. SHIMKUS. Thank you, Mr. Chairman. Press reports indicate that Administrator Jackson is coming to the Hill to speak to Rob Andrews, a Democrat from New Jersey. We sure would have loved to have her at this hearing. She is also meeting with Southern Company CEO today in the D.C. area, so I think it just goes back to the debate that I think EPA is dodging the hearing and not coming. And let us just put that back on the table as we talk about why EPA is not here.

Does anyone believe that shutting down TAPS is a good idea? Mr. Sullivan, yes or no?

Mr. SULLIVAN. Absolutely not, sir.

Mr. SHIMKUS. OK. Mr. Lawrence?

Mr. LAWRENCE. No.

Mr. SHIMKUS. Ms. Ahtuangaruak?

Ms. AHTUANGARUAK. No.

Mr. SHIMKUS. So you don't think shutting down TAPS would be a good idea?

Ms. AHTUANGARUAK. There is a lot of people that require these jobs.

Mr. SHIMKUS. OK, great. Thank you. Mr. Glenn?

Mr. GLENN. No.

Mr. SHIMKUS. Mr. Goldsmith?

Mr. GOLDSMITH. No, it would be devastating for the economy.

Mr. SHIMKUS. Mr. Grafe?

Mr. GRAFE. No, it would be bad for the economy for Alaska——

Mr. SHIMKUS. Great.

Mr. GRAFE [continuing]. But we need to——

Mr. SHIMKUS. Mr. Meyers?

Mr. MEYERS. No.

Mr. SHIMKUS. So everyone agrees that TAPS is a very important—and if you all were here for the opening statements I have a brief connection because my father-in-law—who is deceased—worked on it. So one of the great migration up there for benefit of a better life.

But TAPS is challenged, is it not, Mr. Sullivan?

Mr. SULLIVAN. Yes, sir, principally because of the lower throughput.

Mr. SHIMKUS. And what happens? What happens if you continue to have lower throughput?

Mr. SULLIVAN. Well, at lower rates of throughput, the velocity is slower, the temperature of the oil is slower, and what it does, it creates more technical problems.

Mr. SHIMKUS. Like what?

Mr. SULLIVAN. Like the possibility of leaks but also the possibility of, as we experienced this winter, we had a shutdown that, to be honest, was quite a dicey situation. It was shut down for 5 days in the middle of a very cold Alaska winter.

Mr. SHIMKUS. What does that mean? We don't really understand cold until you talk about Alaskan cold.

Mr. SULLIVAN. Oh, there were spots on the pipeline route that were down to 35, 40 below 0.

Mr. SHIMKUS. So you need the flow to keep it warm enough so that it doesn't crack?

Mr. SULLIVAN. So it doesn't crack, so you don't have technological challenges, and when it is lower throughput, you have water that drops out, you have wax buildup. So there is a number of things that the State is doing that the private sector is doing to address those, but the number one way to address the technical challenge and environmental risks that come with lower throughput is to actually increase throughput.

Mr. SHIMKUS. Increase throughput.

Mr. SULLIVAN. Which is what we are focused on.

Mr. SHIMKUS. Yes, Mr. Goldsmith, can you talk about—being from the University of Alaska—the economic impact of shutdown of TAPS?

Mr. GOLDSMITH. It would be devastating because it would in one swoop knock out about 1/3 of the total jobs for the economy, those jobs associated with activity on the North Slope production——

Mr. SHIMKUS. So we need more supply to keep TAPS operating?

Mr. GOLDSMITH. Exactly.

Mr. SHIMKUS. It is critical.

Mr. GOLDSMITH. And it would also devastate Alaska's revenue picture because we get about 90 percent of our revenues from——

Mr. SHIMKUS. Mr. Glenn, and of course we are also challenged at understanding this great area that you represent and have a title of executive vice—what is your——

Mr. GLENN. Vice President of Lands and Natural Resources——

Mr. SHIMKUS. So what does that mean? I mean in common terminology when we have governors and we have councilmen and we have counties, what is it? Is that a hired position? Is it an elected position?

Mr. GLENN. We were created by Congress. We were created to resolve the issues of claims of aboriginal title and to avoid the mistakes, perhaps, of the lower 48 Native Americans. So they created these 12 land-based corporations. So we are not a fact of Congress but we have imbued our regional corporation with the values of our people. We are owned by the Inupiat Eskimos who live in Northern Alaska.

Mr. SHIMKUS. So is it safe to say that your being present here today is representing those tribal areas——

Mr. GLENN. Yes.

Mr. SHIMKUS [continuing]. And the unity of the——

Mr. GLENN. I am speaking for the residents of the North Slope and I am speaking as someone who is currently employed by this regional corporation but who also has been employed and worked with our local home-rule municipality, which depends on industry in its region for its tax base.

Mr. SHIMKUS. Do citizens in Alaska still get a check based upon oil production in Alaska across the board?

Mr. GLENN. You get a permanent fund distribution annually.

Mr. SHIMKUS. Every year?

Mr. GLENN. Yes.

Mr. SHIMKUS. An annual check? And has that amount gone up or gone down? Anyone know?

Mr. GLENN. It fluctuates but I bet Dr.——

Mr. GOLDSMITH. Yes, last year it was $1,281 and it fluctuates between 1,000 and 1,500.

Mr. SHIMKUS. And what happens if TAPS shuts down?

Mr. GOLDSMITH. That wouldn't go away immediately, but it would disappear pretty quickly because the permanent fund would be needed for——

Mr. SHIMKUS. And I only have 26 seconds left. I really appreciate the testimony. It is really great.

Mr. Meyers, I want to ask about this Environmental Appeals Board. Did we ever authorize it in this statute?

Mr. MEYERS. In the Clean Air Act, no.

Mr. SHIMKUS. So the EPA did a permit and so a regulatory appeals board really denied it. That is the process, right?

Mr. MEYERS. No——

Mr. SHIMKUS. It is really the stationary debate and I will end on this because my time is up. Mr. Grafe, my point would be if you have refineries, a stationary source, we don't regulate and include the emissions of trucks that go in and out of the refinery. And that is the debate of your position that tugboats going to and from the stationary source should be part of that calculation, and I would reject that.

I yield back my time.

Mr. WHITFIELD. The gentleman from California is recognized for 5 minutes.

Mr. WAXMAN. Thank you, Mr. Chairman.

Under the Clean Air Act, EPA's decision-making is deeply informed by the views of stakeholders. This is one of the Clean Air Act's great strengths. We need to be very careful about changes in the act that may have the effect of reducing stakeholders' ability to weigh in on Agency decisions. We often hear from industry as well as the public that they want EPA to consider their views and no one wants to go to court except as a last resort.

In the case of Shell's plan to drill offshore, many groups, including the Inupiat community in Alaska had serious concerns about the impact of Shell's proposed operations on public health and the environment. They were able to petition the Environmental Appeals Board to review EPA's decision to grant Shell an air permit. This bill that is before us would eliminate the right of concerned citizens as well as industry to petition the board for review.

Mr. Grafe, can you describe the role of the Environmental Appeals Board plays in allowing Alaskans to participate in the permitting process?

Mr. GRAFE. Yes. The Environmental Appeals Board allows participation by Alaska citizens without having to file filing fees. They don't need a lawyer. They can participate by phone. It accesses for them an ability to challenge permits if they have been participating in the administrative process.

Mr. WAXMAN. Well, I think that there is a lot to be said for allowing issues to be resolved administratively rather than forcing everybody to the court. The Environmental Appeals Board also has tremendous expertise because it considers all permit appeals.

Mr. Meyers, you described the bill's approach of requiring all appeals to go the D.C. circuit as "centralized for consistency." Doesn't the Environmental Appeals Board already provide such centralization and consistency?

Mr. MEYERS. I would agree it probably centralizes. I am not sure in terms of consistency. It does referencing other decisions. I think they have only been involved in this one decision.

Mr. WAXMAN. In fact, under the bill, onshore drilling preconstruction permits would be reviewed by the Environmental Appeals Board while offshore drilling preconstruction permits would be reviewed by the D.C. circuit. The result is greater fragmentation, not centralization.

I want to point out about this appeals board, it was set up administratively under President Bush and it is consistent with the law that says the EPA can act administratively and the administrator doesn't have to be personally involved in every decision, so she can delegate it to this board.

The bill does allow permit applicants, the oil companies, to file an administrative petition for reconsideration if they oppose an EPA permit decision.

Mr. Lawrence, do you think it is fair to allow only oil companies and no one else to request administrative reconsideration of a permit?

Mr. LAWRENCE. We actually welcome and comply and more than comply with the regulatory requirements that we have. We welcome input to those decisions. The primary concern that we have is with the timing and the timeliness of those decisions.

Mr. WAXMAN. Right. I think fairness means we provide the same procedural rights to all stakeholders, rather than providing special access only to favored parties, and it sounds like you don't disagree with that point of view.

Mr. LAWRENCE. When I look at what we have done through out consultative processes, we have consulted with more than 450 at more than 450 different times across——

Mr. WAXMAN. I am not talking about who you consult with. I am talking about who we——

Mr. LAWRENCE. And we would certainly support comments into an EPA process.

Mr. WAXMAN. Ms. Ahtuangaruak, I am interested in your view about whether it makes sense to have Alaskans come to Washington, D.C., to resolve local clean air issues. How long did it take you to travel here for today's hearing?

Ms. AHTUANGARUAK. I started flying on Sunday night and I got here Monday afternoon about 4 o'clock.

Mr. WAXMAN. Do you think it is appropriate to require Alaskans to come to Washington, D.C.——

Ms. AHTUANGARUAK. It would be a great taxing effort for those that have respiratory difficulties to try to take that trip. Many of them would not be able to come down and provide testimony on their concerns.

Mr. WAXMAN. The bill would also exempt vessel servicing a drillship such as icebreakers and oil spill response vessels from having to install pollution controls.

Mr. Grafe, what percentage of the pollution would this exempt from pollution controls and are there controls that could reasonably be applied to these vessels?

Mr. GRAFE. It would exempt up to 98 percent of the pollution from Arctic offshore drilling from those controls. And although I am not an expert in the technology of air pollution control, I believe there are controls like catalytic converters, et cetera, that could be put on those ships.

Mr. WAXMAN. OK, thank you. I see my time has expired. Thank you, Mr. Chairman.

Mr. WHITFIELD. Mr. Walden, you are recognized for 5 minutes.

Mr. WALDEN. Thank you, Mr. Chairman.

Mr. Meyers, where is the EAB located?

Mr. MEYERS. It is within EPA.

Mr. WALDEN. Physically, is it here in Washington?

Mr. MEYERS. Yes.

Mr. WALDEN. And so if somebody wants to come appear before or protest something, have a hearing, where do they have to come?

Mr. MEYERS. Well, I have not practiced before the EAB myself.

Mr. WALDEN. But it is here in Washington, right?

Mr. MEYERS. It is here in Washington, D.C. There was a reference to allowing testimony by videoconferencing. I couldn't testify to——

Mr. WALDEN. Which would make sense.

Mr. GRAFE. I can speak to that if you would like.

Mr. WALDEN. Briefly.

Mr. GRAFE. You can call in. You don't have to come.

Mr. WALDEN. Yes.

Mr. GRAFE. You don't need a lawyer and there are no filing fees so it is an easier access system for regular citizens.

Mr. WALDEN. You don't need a lawyer?

Mr. GRAFE. No, you don't.

Mr. WALDEN. What a wonderful place.

Mr. Sullivan, first of all, thank you for your varied service to the country and to the State of Alaska. I spent my first year in college at Fairbanks in 1973, '74, and traveled around Alaska. I have relatives up there.

I want to ask you, you mentioned in your testimony lack of transparency, the administration's federal lands policy, something my constituents in Eastern Oregon are very concerned about. Can you just very briefly talk to this new Wild Lands policy that has come out and the impact you see in Alaska?

Mr. SULLIVAN. Yes, sir. That is just another good example. It is mentioned in the testimony but it is Department of Interior, as far as we can tell, internal guidance on possibly having federal lands take on the use of a wilderness designation without actually (a), being oKed by Congress, and even going through a regulatory process. And I will just very quickly mention one of the things that we have been trying to do is get input as a State——

Mr. WALDEN. Right.

Mr. SULLIVAN. —with the Federal Government. We have been asking for input. We have been asking for a heads-up on all these different changes, these lists that I have put——

Mr. WALDEN. Right.

Mr. SULLIVAN. In that particular instance, I had a meeting with a fairly senior Department of Interior official all about State of Alaska wants input on any major decisions, notice, oh yes, we are going to provide that. Within 12 hours after that meeting, they announced the Wild Lands policy, which given that we are the largest holder of BLM lands is going to affect Alaska and possibly overturn what the NPRA is focused on, which is a congressional focus on resource development. And we think they could try and change that through administrative FEA.

Mr. WALDEN. We are already experiencing problems in the Northwest with power line sidings that now are having to be stopped and reviewed under this new Wild Lands policy to see if it really has to be treated as wilderness.

Mr. Lawrence, what are your global competitors' experiences with governments such as Norway, Russia, Greenland and Canada regarding how they allow drilling in the Arctic and how do your spill response capabilities compare to other companies in the Arctic region?

Mr. LAWRENCE. Yes. Thanks very much. And it is not only our global competitors but ourselves. We are active in those areas also. If we look at our global competitors, there has just been significant discovery made offshore Norway. That was just announced last week in the Barents. There is significant activity offshore Russia in the Sakhalin area. We are part of that. There is significant activity offshore Greenland in a major lease sales and we are also part of that but the——

Mr. WALDEN. So what is your timing process going through their regulations and all?

Mr. LAWRENCE. The timing processes are much expedited in places as diverse as Norway and Russia.

Mr. WALDEN. So you are 5 years here. What are you running there?

Mr. LAWRENCE. Years versus 5 years.

Mr. WALDEN. How long?

Mr. LAWRENCE. Years versus 5 years.

Mr. WALDEN. All right. Dr. Goldsmith, I was actually on the Fairbanks campus, not the Anchorage campus.

What effect would market certainty on Alaska OCS coming to full scale have on oil prices in the short- and long-term? See, we are back in kind of a speculation mode here I realize in the market. But there are projections long-term of oil being $120 a barrel. We will try it anyway. But $120 a barrel, I mean part of it is supply and demand, right? And that affects market price?

Mr. GOLDSMITH. I think the major impacts would be on national security, on the balance of trade. I don't think that it would have a significant effect on the price of oil because of the way the world market works. Saudi Arabia could just cut back by a million barrels a day.

Mr. WALDEN. You referenced in your testimony 35,000 jobs long-term. I think it was Mr. Lawrence said 50,000 jobs. I will take either of those numbers right now. But it is significant, right?

Mr. GOLDSMITH. It is significant in the Alaska perspective, certainly, yes. We are a small state and there are a large number of jobs and they are all very high-paying jobs. So they are important jobs.

Mr. WALDEN. I thank all of you for your testimony. Thank you, Mr. Chairman.

Mr. WHITFIELD. Thank you. Mrs. Capps, you are recognized for 5 minutes.

Mrs. CAPPS. Thank you, Mr. Chairman. I am going to begin by, unfortunately, expressing my frustration with this process. While I appreciate that this committee has invited witnesses from Alaska to testify, the potential effects of this legislation go well beyond that State. It is important for this subcommittee, I believe, to hear from EPA as well as other states affected, particularly California, about this legislation prior to marking it up. For that reason and others, I have to say that in its current form, I cannot support this draft bill. If enacted, it would result in significant increases in air pollution in Santa Barbara County, which I represent. At this point I would ask unanimous consent to enter a letter addressed to you from the County of Santa Barbara into the record.

Mr. WHITFIELD. Without objection.

[The information follows:]

JONI GRAY
Fourth District, Chair
SALUD CARBAJAL
First District
JANET WOLF
Second District
DOREEN FARR
Third District, Vice Chair
STEVE LAVAGNINO
Fifth District

BOARD OF SUPERVISORS
County Administration Building
105 East Anapamu Street
Santa Barbara, CA 93101
Telephone: (805) 568-2190
www.countyofsb.org

COUNTY OF SANTA BARBARA

FAX DATE: April 12, 2011

The Honorable Lois Capps
U.S. House of Representatives
2231 Rayburn House Office Building
Washington, D.C. 20515

Dear Lois:

I have sent the attached letters to Chairman Whitfield and Ranking Minority Member Rush of the Energy & Commerce Subcommittee on Energy & Power to express the County of Santa Barbara's concern with provisions contained in the discussion draft of the Jobs and Energy Permitting Act that would weaken California State regulations limiting air pollution.

Emissions from marine vessels represent the single largest source of smog forming air pollution in Santa Barbara County and account for over 40% of the air pollution emissions. It is very important to the attainment and maintenance of the air quality health standards that all marine vessels plying the Santa Barbara Channel are subject to air quality regulations, which makes the provisions of the Jobs and Energy Permitting Act particularly troublesome.

Please urge your colleagues that serve on this Committee to address the concerns of the County of Santa Barbara regarding those provisions that would weaken air quality regulations that protect the health of local residents.

Sincerely yours,

Tom

Thomas P. Walters
Washington Representative

TPW:sbm

Attachments

JONI GRAY
Fourth District, Chair
SALUD CARBAJAL
First District
JANET WOLF
Second District
DOREEN FARR
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STEVE LAVAGNINO
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COUNTY OF SANTA BARBARA

FAX DATE: April 12, 2011

The Honorable Edward Whitfield, Chairman
Energy and Power Subcommittee
Committee on Energy & Commerce
U.S. House of Representatives
2125 Rayburn House Office Building
Washington, D.C. 20515

Dear Mr. Chairman:

I am writing on behalf of the County of Santa Barbara to express its concern with provisions contained in the discussion draft of the Jobs and Energy Permitting Act that would weaken California State regulations limiting air pollution.

The Santa Barbara County Air Pollution Control District (SBAPCD) is concerned that provisions of the bill would loosen modeling of toxic risk so that federal air quality standards would no longer protect coastal residents from marine vessel emissions. The measure would also void applicability of the California State Harbor Craft Regulations, which are designed to reduce diesel particulate matter (PM), oxides of nitrogen (NOx), and reactive organic gases (ROG) from commercial harbor craft. Under this draft, any vessel servicing a platform or otherwise associated with an OCS source (such as crew and supply boats), would be exempted from any emission control requirement as stipulated. Furthermore, provisions would shorten the period of time that emissions from exploratory activities are considered to be stationary sources and, therefore, applicable to regulation. This time period would be limited to actual commencement and cessation of drilling, so that emissions from set up and breakdown would no longer be taken into account. Finally, the bill would eliminate the current adjudicatory process exercised by the APCD's hearing board.

Emissions from marine vessels represent the single largest source of smog forming air pollution in Santa Barbara County and account for over 40% of the air pollution emissions. It is very important to the attainment and maintenance of the air quality health standards that all marine vessels plying the Santa Barbara Channel are subject to air quality regulations, which makes the provisions of the Jobs and Energy Permitting Act particularly troublesome.

As your committee considers the Jobs and Energy Permitting Act Discussion Draft please addresses the concerns of the County of Santa Barbara regarding those provisions that would weaken air quality regulations that protect the health of local residents.

Sincerely yours,

Thomas Walters

Thomas P. Walters
Washington Representative

TPW:sbm

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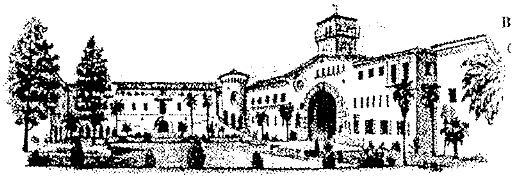

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COUNTY OF SANTA BARBARA

FAX DATE: April 12, 2011

The Honorable Bobby Rush
Ranking Minority Member
Energy and Power Subcommittee
Committee on Energy & Commerce
U.S. House of Representatives
2322A Rayburn House Office Building
Washington, D.C. 20515

Dear Congressman Rush:

I am writing on behalf of the County of Santa Barbara to express its concern with provisions contained in the discussion draft of the Jobs and Energy Permitting Act that would weaken California State regulations limiting air pollution.

The Santa Barbara County Air Pollution Control District (SBAPCD) is concerned that provisions of the bill would loosen modeling of toxic risk so that federal air quality standards would no longer protect coastal residents from marine vessel emissions. The measure would also void applicability of the California State Harbor Craft Regulations, which are designed to reduce diesel particulate matter (PM), oxides of nitrogen (NOx), and reactive organic gases (ROG) from commercial harbor craft. Under this draft, any vessel servicing a platform or otherwise associated with an OCS source (such as crew and supply boats), would be exempted from any emission control requirement as stipulated. Furthermore, provisions would shorten the period of time that emissions from exploratory activities are considered to be stationary sources and, therefore, applicable to regulation. This time period would be limited to actual commencement and cessation of drilling, so that emissions from set up and breakdown would no longer be taken into account. Finally, the bill would eliminate the current adjudicatory process exercised by the APCD's hearing board.

Emissions from marine vessels represent the single largest source of smog forming air pollution in Santa Barbara County and account for over 40% of the air pollution emissions. It is very important to the attainment and maintenance of the air quality health standards that all marine vessels plying the Santa Barbara Channel are subject to air quality regulations, which makes the provisions of the Jobs and Energy Permitting Act particularly troublesome.

As your committee considers the Jobs and Energy Permitting Act Discussion Draft please addresses the concerns of the County of Santa Barbara regarding those provisions that would weaken air quality regulations that protect the health of local residents.

Sincerely yours,

Thomas Walters

Thomas P. Walters
Washington Representative

TPW:sbm

Mrs. CAPPS. The letter expresses concerns with provisions contained in the discussion draft that would weaken California State regulations limiting air pollution. Thank you.

Mr. Grafe, I want to thank you for your testimony. I thank all the witnesses for your testimony today.

I represent California's central coast in Congress. We are home to an active offshore oil and gas industry. Right now as I speak over 20 platforms are drilling in the Santa Barbara channel just a few miles off our coast. Those facilities emit air pollutants that are known carcinogens and cause respiratory problems. The facilities are also serviced and supported by marine vessels that release large amounts of air pollution.

You write in your testimony that from 75 to 96 percent of the total of each regulated pollutant is emitted by support vessels in the Arctic. Are there no ways for the industry to control these emissions or are there, Mr. Grafe?

Mr. GRAFE. I think the technology exists that would be able to control those emissions if EPA applied them.

Mrs. CAPPS. Is this technology readily available?

Mr. GRAFE. I believe it is, although I am not an expert on the technology. But I believe it is.

Mrs. CAPPS. Would you agree with me that the draft bill would bar a permitting authority from requiring a company to apply those technologies in order to reduce pollution from these vessels?

Mr. GRAFE. I agree.

Mrs. CAPPS. I am also concerned that the draft bill would bar the application of other clean air rules. For example, the California Air Resources Board has promulgated a harbor craft rule designed to help coastal areas come into attainment with ozone and particulate matter air quality standards. It appears that the proposed bill would exempt service and support vessels for OCS drilling operations from the current harbor draft requirements. Would you agree with me that the proposed bill would help companies escape regulation of the harbor craft rule recently adopted by the California Air Resources Board?

Mr. GRAFE. Yes, I think it would.

Mrs. CAPPS. Mr. Chairman, I think that speaks to the need, at least from this perspective, for an additional hearing on this draft bill so that we can get some other folks to enter into the discussion. I think we need to have use of officials from California on the record. I know that there are many that have already expressed their concern to me about what is being designed.

You list in your testimony a variety of health problems associated with the potential emissions from proposed offshore drilling. Santa Barbara County expects to realize significant air pollution reductions from service and support boats that serve the OCS drilling facilities as a result of the California Air Resources Board harbor craft regulation—VOCs, 40 tons per year; particulate matter, 8 tons per year; reactive organic compounds, 5 tons per year.

So I am wondering if you would share with the committee some of the public health benefits that people living in my county or some similar folks that make their living in Santa Barbara Channel like fisherman, which I am sure is going to be the same in Alaska as well to see as a result of these reductions?

Mr. GRAFE. Lower rates of asthma, lower emergency room visits, et cetera.

Mrs. CAPPS. Those are pretty big cost savings. It is important for a responsible regulation to occur, don't you agree, for our service and support vessels associated with OCS development?

Mr. GRAFE. I agree and that is true of Santa Barbara. It is true in the Arctic even more so perhaps.

Mrs. CAPPS. Emissions from marine vessels represent the single largest source of smog-forming air pollution in Santa Barbara County. They account for over 40 percent of the air pollution emissions. I think it is important to the attainment and maintenance of the air quality health standards that all marine vessels applying anywhere in my opinion but at least in the areas that I represent, Santa Barbara Channel, are subject to air quality regulations.

And whatever time I have left, Ms. Ahtuangaruak, I thank you so much for your testimony, for traveling to Washington. I think it is important for the committee to know the personal stories of people, a person that you know who would be impacted by this draft bill on your community, because you are the ones who will bear the results of the regulations.

Ms. AHTUANGARUAK. We have many people that have developed respiratory distress. I have grandchildren that have asthma. One of them is living with me right now. Anything that affects the air for this child would be devastating. For us, having to send a child out of the community to receive care when we are in the villages, it takes the parent with them. It takes all the hats that they wear with them. So it takes not just the patient but the hats that the family wears with them. It costs a lot for us to leave the village. We don't have many resources to help us while we are out there. We have minimal resources to obtain——

Mr. WHITFIELD. You can go on but just summarize quickly.

Ms. AHTUANGARUAK [continuing]. Assistance for our efforts to receive healthcare. And it is very difficult. And it costs a lot.

Mr. WHITFIELD. Thank you.

Mrs. CAPPS. Thank you very much.

Mr. WHITFIELD. Mr. Barton, you are recognized for 5 minutes.

Mr. BARTON. Thank you. My good friend from California just talked about 20 active drilling platforms off the coast of California I assume near her district or in her district. Mr. Sullivan, how many platforms would be drilling today in Alaska if you had gotten the permits that you asked for?

Mr. SULLIVAN. Well, Representative Barton, I know that—and maybe Mr. Lawrence can speak to this more specifically, but I know that last summer there were at least 5 exploration wells that were going to be drilled by Shell. That would have been hundreds of jobs for Alaskans and——

Mr. BARTON. Five for 4 months. Mr. Lawrence, is that a good number?

Mr. LAWRENCE. Yes, that is correct.

Mr. BARTON. I think 5 is, what, 20 percent of 25 or 25 percent. Mr. Sullivan, in your opinion is there a true public health concern for the people of Alaska if five platforms drill 4 months a year?

Mr. SULLIVAN. Mr. Barton, I am not a health expert, but I think that the answer in general is it would be minimal and I also think that it is important to recognize—and maybe Mr. Glenn can speak to this—that on the North Slope, including leaders such as the mayor of the North Slope Borough who is the senior elected official up there, there is support for this exploration drilling.

Mr. BARTON. Mr. Lawrence, can you tell me if California is self-sufficient in oil production in terms of do they produce enough oil in California that is turned into gasoline to take care of all the cars and trucks that are in California?

Mr. LAWRENCE. No.

Mr. BARTON. And to the extent they import oil, isn't most of the oil they import, if it is domestically, isn't it from Alaska?

Mr. LAWRENCE. Much of the oil that comes to California is coming from Alaska and much of that is dependent on TAPS.

Mr. BARTON. Could you, Mr. Lawrence, compare your interaction with the EPA in Alaska to your interaction around the world with other national environmental agencies?

Mr. LAWRENCE. I have had the privilege to be able to look for oil and gas around the world in my role as leading Shell's exploration effort. This is perhaps the most difficult region I have ever been in in any country, in any location for working through the permitting process in Alaska.

Mr. BARTON. And how many billions of dollars has your company invested so far in these leases?

Mr. LAWRENCE. We have spent over $2 billion on the leases. We have spent over $1.5 billion on exploratory activities, including science programs, including seismic programs, and including what we can do to develop this safety.

Mr. BARTON. And you had to be given the final permit to drill one well, right?

Mr. LAWRENCE. In the time that I have waited to drill this one well in Alaska, I have drilled more than 400 wells, exploratory wells, worldwide.

Mr. BARTON. Mr. Meyers, you were general counsel for the minority of this committee when we passed the Clean Air Act amendments back in 1990, isn't that correct?

Mr. MEYERS. No, I was not general counsel at that point in time.

Mr. BARTON. You were on the Republican committee staff?

Mr. MEYERS. I was chief of staff to a member on the Conference Committee for the 1990 Clean Air Act amendments.

Mr. BARTON. So you were part of this, right?

Mr. MEYERS. I was a part of the discussions, yes.

Mr. BARTON. Do you have any recollection on this specific issue and those discussions?

Mr. MEYERS. Yes.

Mr. BARTON. Was it the intent, then, of those that—I was a junior member so I was not a conferee but I was a member of the committee. I certainly don't have a recollection that the way EPA is acting today was our intent. Can you enlighten us if you have a recollection when we put these things into the law?

Mr. MEYERS. Well, I think my personal recollection is not, obviously, part of the legislative history. When I looked at the legislative history of this, it seemed to be centered primarily on the experience of California, primarily on the experience of trying to address onshore air pollution, and trying to make sure that if somebody onshore, a factory had installed something that was a stationary source offshore would have to do something similar. That seems to be clearly what was intended.

Mr. BARTON. And my final question, Mr. Lawrence, can you have your staff compare the emissions of one of your drilling platforms to the emissions of a 747 airplane?

Mr. LAWRENCE. Yes, we would be happy to provide that comparison.

Mr. BARTON. Because my guess is that a 747 is going to have more emissions flying in and out of LAX than one drilling platform operating 4 months off the coast of Alaska. That is my guess but I could be wrong.

With that I yield back.

Mr. WHITFIELD. Thank you, Mr. Barton. Mr. Green, you are recognized for 5 minutes.

Mr. GREEN. Thank you, Mr. Chairman. Like my colleagues, I would like to express that we give EPA as much of advanced notice for these hearings simply because they need to be at the table and I would hope we would keep that reserve place that my colleague from Texas, Barton, mentioned that for the EPA administrator.

Mr. Lawrence, first, congratulations. I have a district in Houston and I know Shell got one of the first actual drilling permits in the Gulf of Mexico, deepwater, and having a lot of Shell employees and refinery and chemical plant in our district, I was proud of that. I am glad the Agency is actually releasing more permits, not near as much as we need.

But let me talk to you about Alaska because I have had the opportunity to be in Alaska. I was actually on a drilling rig in the Cook Inlet Kenai Peninsula in the North Slope both as a state legislator and as a Member of Congress back in the '90s. Let me ask you about this Environmental Appeals Board. EPA has twice issued permits and the Environmental Appeals Board has twice remanded the permits citing inadequate analysis at the port. Critics of the bill say that the language transfers any authority of the permit decisions from the EAB to federal courts, which I have a local shareholder involvement. However, as far as I know—and it was made earlier—that the same location is here in Washington and so would be the federal court. And I know that may have been under a Republican administration that the EAB was created, but there seems to be a problem. Can you elaborate on the EPA does not issue a final order in bringing an issue to judicial review is extremely difficult compared to what has been happening?

Mr. LAWRENCE. Yes, I think the greatest challenge that we face is one of time. And to be clear, the drilling season in Alaska is at the most 4 months, from July 1 and it goes to at the latest October 30. The permitting process and the reviews of that permitting process and that challenge typically can take longer than the time that that drilling window is open. And what that does is effectively every time it goes through one of these review processes that extends beyond the time for the drilling window and causes delays for another year. It takes more than a year to plan the logistics to be able to drill a well in Alaska, to be able to do it safely, and that is what we are trying to do is to get out in front with enough clarity, certainty to move forward in a timely manner and to have our investments follow that path.

Mr. GREEN. OK. And I understand over 6 years and 1.5 billion and you cite Shell's work multiple years, the 3–D seismograph collection, first of its kind, baseline science shallow hazard surveys, geotechnical programs, numerous social investment initiatives and hundreds of meetings with North Slope residents. Additionally, you have utilized unmanned aircraft and seabed listening devices and unmanned submarines to name a few. And I know I read Mr. Grafe's grievances with the process, but all those things that Shell did, is that required in Norway or Denmark who has control of Greenland, or even Canada?

Mr. LAWRENCE. We have done one of the most intensive preparations for this program that we have done in any theater around the world.

Mr. GREEN. OK. In my time left I want to get back to the international issue because when we ran into the moratorium in the Gulf of Mexico, is said why don't we just apply Norway standards because I have been to Norway. I know all our majors are there in Statoil, at least the last time we had a lease in the Gulf actually was the highest bidder for leases. And if Norway can drill in the Gulf and we can drill off Norway and they have, I understand, the gold standard, Norway, Russia, Greenland, and Canada are exploring the same thing. Can you talk in detail about how far they are along in developing new resources and the successes or failures you have had.

Mr. LAWRENCE. Yes, I would just like to be clear. I think we have the gold standard here in the U.S. also and I think we operate to that gold standard and we——

Mr. GREEN. Is there anything different between our standard and what you would do in the high north and Norway?

Mr. LAWRENCE. No, we have taken most of the best practices that we have had from both places looking at what we would do in Norway and what we would do in Alaska and compared those. Let me just say the development of those standards, we have been operating in places like the North Sea for many years. There are things such as a safety case, which describes identification of the hazards, ways to mitigate and put barriers to those hazards, clear roles and accountabilities for that. We support that. We implement those in all of the operations that we have.

If we look at such things as how we would handle mitigants to stakeholders in communities, we have the same kind of practices in dealing in Norway as we would here. We have looked at discharge in Norway. How does that compare to discharge in Alaska? We have tried to take the best practices from both. So Norway has standards. We have strong standards here that protect the environment and we comply with and exceed those standards. In Russia, we are drilling wells, producing wells in Russia right now. Russia has similarly elevated their standards and we have complied with those. The difference is the uncertainty in the timeline with which you are able to move through those. And they provide clarity so you can get to the point in Russia where you are able to drill a well.

And I would just say finally in Greenland we have now just applied for a permitting, but as you know, another oil company actually drilled wells off of Greenland after a much shorter time in accessing their permits.

Mr. GREEN. Mr. Chairman, it is amazing that we are much slower than Russia. Thank you.

Mr. WHITFIELD. That is a sad state of affairs. Mr. Gardner, you are recognized for 5 minutes.

Mr. GARDNER. Thank you, Mr. Chairman, and thank you again for your time and testimony and traveling so far to be here to many of you.

But as I have noticed on this committee throughout the short 99 days that I have been in Congress, there seems to be a lot of things that get said that aren't the truth in terms of how they affect or impact the bill. And so I think there is a lot of miscommunication and confusion that is out there and the various testimony has presented. And so I want to clarify a little bit of this.

The fact is these ships that people talked about will be and are regulated. They are regulated under Title II of the Clean Air Act. Is that correct, Mr. Meyers?

Mr. MEYERS. Yes. And as my written testimony points out, EPA has been very active in this area over the last 10 years.

Mr. GARDNER. So to say that they are completely exempted, gutted, is untrue.

Mr. MEYERS. Right.

Mr. GARDNER. And when somebody has a refinery, is the delivery truck to that refinery counted as the refinery's emissions?

Mr. MEYERS. That does not apply. Basically, the Clean Air Act contains a definition in 302(z) of a stationary source which excludes those emissions resulting directly from an internal combustion engine for transportation purposes or from a non-road engine—which is what a marine vessel is—or a non-rotor vehicle.

Mr. GARDNER. So the train that delivers coal to the factory, the UPS truck delivers parts to the dealership, those aren't counted as part of that store's source.

Mr. MEYERS. I think the issue is—and as this legislation would still count those emissions. Those emissions will be counted and effectively attributed to the source for other purposes. The issue here is whether you are going to regulate a ship as a stationary source. And the act doesn't require that. That is the interpretation. The interpretation difference between myself and Mr. Grafe's interpretation of the act is he reads Section 165 differently than I do in terms of just the statutory construction. So we have fundamental disagreement on how PSD applies.

Mr. GARDNER. Thank you, Mr. Meyers. And then I have also heard that this takes away people's ability to address their grievances, to comment. Can you please tell me a little bit about how the notice-and-comment period would work under this?

Mr. MEYERS. Well, it doesn't affect any other procedures. It says basically that you have 6 months from the time you have a complete permit application and then it becomes a final agency decision. The issue here that we have been talking about with respect to EAB is that EPA is effectively taken a position in filings in the court case that the Clean Air Act statutory limits do not apply the EAB review.

Mr. GARDNER. So the assertion that the bill will prevent grievances from being heard is untrue?

Mr. MEYERS. Yes, basically it will be a shortened process but the public process provisions are not amended by the legislation and everybody has recourse to file a judicial petition.

Mr. GARDNER. Thank you. Do they need a lawyer to do that?

Mr. MEYERS. Pardon?

Mr. GARDNER. Do they need a lawyer to do that?

Mr. MEYERS. Well, as a lawyer I would say it is advisable but——

Mr. GARDNER. It is not the lawyer job creation act.

Mr. MEYERS. I believe it would be possible for somebody to appear on their own behalf but——

Mr. GARDNER. Thank you. And Mr. Sullivan, what certainty would the Jobs and Energy Permitting Act provide for businesses and job creators in Alaska?

Mr. SULLIVAN. Representative Gardner, I think that is the key question because what I try to lay out in the written testimony is that across the board in terms of exploration and production of hydrocarbons on both state and especially federal lands, there is immense uncertainty across the board throughout the State of Alaska. That is why I provided all those different examples. And what we see, it is chilling investment companies. They don't know how to make decisions right now.

Mr. GARDNER. This would provide certainty?

Mr. SULLIVAN. This would provide significant certainty in that——

Mr. GARDNER. Thank you. Mr. Lawrence, would the millions of acres leased in offshore Alaska where companies like yours have not been permitted by the government to drill be included in what President Obama refers to as "idled leases" when he talks about the use-it-or-lose-it issue?

Mr. LAWRENCE. It is particularly painful to me to look at the use-it-or-lose-it issue as it would apply to Alaska since I have been trying to use it for the last 5–1/2 years.

Mr. GARDNER. You have been trying to use this—and thank you. That is good enough.

Before Alaska, what was the longest amount of time you have witnessed between a lease being purchased and drilling operations commencing for permitting reasons?

Mr. LAWRENCE. This is the longest that I have seen for permitting reasons.

Mr. GARDNER. For permitting reasons, thank you. Mr. Meyers, in your testimony, you mentioned that EPA's regulations promulgating the relevant Clean Air section, Section 328, should not be used for the purpose of preventing exploration and development of the OCS. However, after over 5 years, that appears to be exactly what is happening here. Would you agree?

Mr. MEYERS. Yes, I have not been involved in a lot of this but I think that the process has been excessive.

Mr. GARDNER. Mr. Sullivan?

Mr. SULLIVAN. Yes.

Mr. GARDNER. Mr. Lawrence?

Mr. LAWRENCE. Yes.

Mr. GARDNER. Mr. Glenn?

Mr. GLENN. Yes.

Mr. GARDNER. Thank you. Thank you for your time today. I yield back my time.

Mr. WHITFIELD. Thank you, Mr. Gardner. The gentleman from Kansas, Mr. Pompeo, is recognized for 5 minutes.

Mr. POMPEO. Thank you, Mr. Chairman. I think we have gotten to most of the things that I wanted to talk about this morning, but I have just a couple of things that I would like to follow up on.

Now, you may not all see this, but this is not the only place that EPA is working against American energy production. It is not just offshore. In fact, if you come to Kansas, you will see the same thing. You will see the same thing with respect to folks that are trying to grow live stock guise. EPA in my judgment has truly entered a realm that we have not seen in an awfully long time. And so when you see them taking rules and contorting them into places which do incredible harm to American job creation, I think what we are doing here today is just a tiny step along the task that I am glad Chairman Whitfield and Chairman Upton are leading us down.

I wanted to ask you, Mr. Lawrence, or perhaps Mr. Sullivan, too, so you have been at this since 2006. There was a change in administrations then. Have you seen any significant change in the way EPA has been responsive to you as the administration changed?

Mr. LAWRENCE. I would agree with the comment that was made earlier that with the EPA I don't see this as an administration issue. I think it is an issue that sits within the EPA.

Mr. POMPEO. So it is internal to either the culture or the people——

Mr. LAWRENCE. Yes, and again I am not an expert on the internal culture.

Mr. POMPEO. Yes, I understand that. I am becoming one.

Mr. LAWRENCE. Yes.

Mr. SULLIVAN. If I may, I think what we try to do is lay out examples beyond the EPA with regard to resource development in Alaska and I do think that there has been a shift with regard to resource development and very proactively focused shutdown resource development mindset among a lot of federal agencies, not just the EPA. And that is what we try to do on our written testimony.

Mr. POMPEO. I appreciate that. I guess my last question or perhaps a couple questions, Mr. Grafe, tell me a little bit about your practice and who are the funding sources for your practice?

Mr. GRAFE. Well, I don't have the exact funding sources, but we are a nonprofit law firm that represents at no cost communities, environmental groups, individuals, so we don't charge our clients. We get money from members who are members of our organization, just regular people. We have got some foundation money and if you would like I can provide—it is all publicly available.

Mr. POMPEO. I would appreciate that. Is there any government money that comes to you either directly or through grants to foundations that in turn provide that capital to you?

Mr. GRAFE. No, I don't think we get——

Mr. WHITFIELD. Mr. Pompeo, would you yield for just 1 minute?

Mr. POMPEO. Yes.

Mr. WHITFIELD. What about being awarded legal fees after a case has been filed against the EPA?

Mr. GRAFE. Well, against—the Clean Air Act has provisions.

Mr. WHITFIELD. But I mean does your law firm receive revenue from that?

Mr. GRAFE. Yes, we do receive revenue from——

Mr. WHITFIELD. Thank you, Mr. Pompeo.

Mr. POMPEO. Thank you, Mr. Chairman. I appreciate that. I was heading that direction but thanks for getting us there more quickly. I yield back the balance of my time.

Mr. WHITFIELD. I am sorry.

Mr. POMPEO. No, don't be sorry. I am thrilled.

Mr. WHITFIELD. I recognize the gentleman from Virginia, Mr. Griffith, for 5 minutes.

Mr. GRIFFITH. Thank you, Mr. Chairman. Let me ask this of Mr. Sullivan. What has Canada's experience in Arctic drilling proven thus far? And I am looking at the geology climate, you know, and are there differences? What has Canada's experience been?

Mr. SULLIVAN. Well, right now they have a very active program with regard to the oil sands and I think that has been an area where, although there is environmental concerns there, they have been addressed in many ways and they have very active production and investment in that part of Canada that is really creating thousands if not tens of thousands of jobs.

Mr. GRIFFITH. How does their regulatory framework compare to ours?

Mr. SULLIVAN. I don't know the specifics but we could get back to you on——

Mr. GRIFFITH. That would be great but you are under the impression that it doesn't take 5, 6 years to get moving on a project?

Mr. SULLIVAN. Absolutely. It doesn't.

Mr. GRIFFITH. All right. And then you listed off in your comments—and they may have been in your written statement but I couldn't find them—the various places that you had visited and that you had concerns that the EPA might actually be inadvertently harming the environment because they were allowing all of this production and activity to be pushed into other countries where they had no regulation or did not have regulations close to the regulations that we have in the United States. Could you expand on that for me, please?

Mr. SULLIVAN. Sure. I think it is a point that is often overlooked because——

Mr. GRIFFITH. Me, too.

Mr. SULLIVAN. —ostensibly this very anti-development policy that we are seeing in Alaska is supposedly undertaken to protect the global environment. We actually think it has the opposite effect because if you drive development and production from countries or places like Alaska that have world-class environmental standards to places overseas that don't. And as I mentioned, every one of those countries I mentioned I have been to, then you from a global environmental perspective, you are actually degrading the global environment because production is taking place in areas where it is not nearly as stringent as it would be in Alaska.

Mr. GRIFFITH. Could you tell me what those countries were again because——

Mr. SULLIVAN. I mentioned Brazil, Russia, Azerbaijan, Kazakhstan, Saudi Arabia.

Mr. GRIFFITH. OK. And as a result of not using the energy, would you think that it might also be that we are also pushing some jobs in a similar vein over there that could be here that would also be regulated more here than they would be there?

Mr. SULLIVAN. Absolutely. There is no doubt about that.

Mr. GRIFFITH. And when you talk about the global environment, you are talking about climate change and air quality issues, are you not?

Mr. SULLIVAN. I am talking about degradation to the global environment, yes.

Mr. GRIFFITH. And wouldn't it be true that the nations that you mentioned, with the exception of maybe Saudi Arabia, all of that air is the same air that we are breathing a few days later?

Mr. SULLIVAN. Well, not being a scientist, I think it is eventually all air that we are all breathing.

Mr. GRIFFITH. If I told you that there was a NASA study that said the air from the Gobi Desert got to the eastern shore of Virginia in 10 days, you wouldn't disagree with that?

Mr. SULLIVAN. No.

Mr. GRIFFITH. And if it is going from Gobi to the eastern shore of Virginia, it is probably going from Russia and Kazakhstan to Alaska, would you not agree with that?

Mr. SULLIVAN. Yes, sir.

Mr. GRIFFITH. Let me switch to my friend whose name I can't pronounce. Can you pronounce it for me again, ma'am?

Ms. AHTUANGARUAK. Ahtuangaruak.

Mr. GRIFFITH. It may take me a while to get that down. I have some genuine curiosity. I get global warming, rains, floods, caribou crossing the rivers. I didn't get the lack of growth in the plants that the caribou would eat once they cross the rivers and the insect production for the birds. Can you explain those to me and how that plays into this?

Ms. AHTUANGARUAK. The early growth of the plants are very important for the calves. And if the calves aren't able to get across the rivers before they break up, they may not get to the important——

Mr. GRIFFITH. So it is more the river than the plant production?

Ms. AHTUANGARUAK. All of it is related.

Mr. GRIFFITH. OK. I guess my concern was is that if the global warming theory has it that the rivers are flooded, it would seem to me that there would be more plant production. Now, I understand getting across the river. I got that part. Do you see where I am going?

Ms. AHTUANGARUAK. Yes.

Mr. GRIFFITH. Do you agree or disagree with me that there ought to be more plants if it is warmer.

Ms. AHTUANGARUAK. We need the animals to be there.

Mr. GRIFFITH. I understand that. I got that. I followed that part of it. I just didn't follow the other. How about the insects?

Ms. AHTUANGARUAK. With the insects it is related to the environment, the water, the growth of the plants, all of those are associated. If we are having changes in our environment and less of those things that are occurring naturally, it affects the amount of the insects that are available for the birds to eat.

Mr. GRIFFITH. I know this sounds like a crazy question, but it is the kind of stuff I actually like. Do you know how many insect species you have in that area?

Ms. AHTUANGARUAK. Not——

Mr. GRIFFITH. I don't know mine either. I am just curious.

Ms. AHTUANGARUAK. Not specifically. I know there was 114 bees at one time studied in Alaska, but that is all I know for sure.

Mr. GRIFFITH. All right. I appreciate it very much. I yield back my time, Mr. Chairman.

Mr. WHITFIELD. The gentleman from Louisiana, Mr. Scalise, is recognized for 5 minutes.

Mr. SCALISE. Thank you, Mr. Chairman. I appreciate you holding this hearing and bringing this legislation. Clearly, I think we have seen a pattern for over a year now with this administration, a broader sense with EPA, the inability to allow American people to go to work, creating American jobs and creating American energy. And it has been a big frustration of mine. In south Louisiana, we are experiencing—I appreciate the comments that we had on the first panel from Senator Murkowski and Senator Begich and our colleague Representative Young in the battles that are being fought in Alaska.

And you know, it is very frustrating hearing some of the same stories, you know, in the case here, EPA, 6 years trying to get a permit for one company to go to explore to create jobs for American energy. And you know, we are seeing that in south Louisiana where so many of our people are still trying to get back to work drilling safely there. And over 12,000 jobs we have lost in the last 11 months in many cases because the administration is not allowing our people to go back to work who didn't do anything wrong, who had absolutely nothing to do with the mistakes of BP. These were companies who were drilling safely and producing energy for this country.

And you know, it is interesting when you hear the President going to Rio and saying we are going to drill in Brazil and then he comes back to America and says oh, and we are going to reduce American reliance on foreign energy by 1/3. Well, you know, if you are shutting down production in America, you are going and bragging to the people of Brazil that you are going to drill there, and then you come back here and say oh, by the way, we are going to reduce our imports by 1/3, those numbers don't add up. And the American people, I think, get that. When you see the skyrocketing price of gasoline, I mean maybe their approach is if they let the gas prices get so high, then there would be a reduction in demand but it is because our economy would be crippled. And that is not a position we can allow ourselves to be in.

And so I have got a few questions for the panel here. I will start with Mr. Sullivan. You know, we have heard statements from the administration that, you know, America doesn't have the resources and we need to get it from other places because we have got less than 2 percent of the world's reserves, but yet I hear that there are a lot of—especially with the new technology that is out there—there is a lot more reserves that we have in this country that are prohibited by the Federal Government from even being explored.

So Mr. Sullivan, from your experience in Alaska, what would you respond to in relation to those claims by the administration that less than 2 percent of the world's reserves are in America?

Mr. SULLIVAN. Well, I think first of all, the U.S. Geological Survey in 2008 showed that the North Slope of Alaska has estimates of 40 billion barrels of convention oil, 236 trillion cubic feet of gas, and it noted that that is probably the largest area of oil in the Arctic of all the other countries. And that is just conventional. When we are talking about heavy and viscous and shale oil, you are going into several billions more barrels.

So I think one of the important things we wanted to make sure the committee was aware that Alaska remains a world-class hydrocarbon basin compared to any other place in the world. It could supply America for decades.

Mr. SCALISE. And I appreciate that because I have heard similar numbers. I think Senator Begich said 40 to 60 billion barrels that they want to go and be able to explore for in Alaska, you know, of course, in the Outer Continental Shelf. In south Louisiana, there are many areas of the shelf that are closed off from exploration that have vast amounts of reserves as well. And of course, with the new technologies, the ability to go and explore and extract and of course the jobs that go with it.

I want to ask Dr. Goldsmith, in terms of jobs lost, opportunity lost, energy security lost, by putting these delays in place, by having administrative bureaucracies shutting off our ability to go and access these 40 billion or more barrels, what does that mean in terms of jobs lost in America and energy security lost in America?

Mr. GOLDSMITH. Well, I think the biggest risk is postponement so that the pipeline shuts down. And that would have the most dramatic effect on jobs both in Alaska and nationally. You would be talking about 100,000 jobs in Alaska and probably the same amount in the rest of the U.S. for sure.

Mr. SCALISE. So 200,000 jobs just on the effect—if I could, Mr. Chairman, I want to submit for the record—this is a letter from the Alyeska Pipeline Company, a company that operates the pipeline. And they do detail the importance of the pipeline and how——

Mr. WHITFIELD. Without objection.

[The information follows:]

Alyeska pipeline
SERVICE COMPANY

P.O Box 196660
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TELEPHONE (907) 787-8700

Thomas J. Barrett
President

April 8, 2011

The Honorable Edward Whitfield
Chairman
Subcommittee on Energy and Power
Committee on Energy and Commerce
U.S. House of Representatives
2125 Rayburn House Office Building
Washington, DC 20515

The Honorable Bobby Rush
Ranking Member
Subcommittee on Energy and Power
Committee on Energy and Commerce
U.S. House of Representatives
2125 Rayburn House Office Building
Washington, DC 20515

Re: Hearing on the American Energy Initiative, April 13, 2011

Dear Chairman Whitfield and Ranking Member Rush:

Thank you for the opportunity to contribute to the American Energy Initiative hearing by providing information about declining throughput on the Trans Alaska Pipeline System (TAPS), a system which every day transports about 12% of domestic U.S. crude oil production. As the President of Alyeska Pipeline Service Company, I write to you on behalf of our 800 employees and 800 additional contract employees.

Since coming to Alyeska in January of this year, the question I have received most often is: When will the declining flow of crude oil in our pipeline become a problem? My response is simple: We have a problem now – today. It is just not something that is going to be an issue at some point down the road. And the challenges caused by declining throughput will only increase if the decline is not reversed. Stopping our steady decline and increasing throughput in the Trans Alaska Pipeline System is an urgent concern for everyone who works on TAPS, for our owners, for Alaska, and for our country.

TAPS was designed as a 48-inch warm-oil pipeline. At its peak throughput in the late 1980s, we were moving about 2.1 million barrels of oil per day. Since 1989, we have experienced a steady decline in crude coming off of the North Slope. Today, our average throughput is about 640,000 barrels a day. If new supplies do not come into the pipe, we expect an annual decline of between 5 and 7 percent. At one time, according to Energy Information Administration data, TAPS delivered about 25 percent of our nation's domestic crude oil supply. In 2010, TAPS delivered about 12.4 percent of our nation's oil production.

The declining throughput is creating increasingly complex challenges for Alyeska. The most pressing decline-related issue facing us today is the temperature of the oil in the pipeline. The temperature of the crude oil declines as flow rates decline. With lower flow rates it takes longer for the oil to travel from the North Slope to Valdez, which allows more time for the oil to cool. Temperature of the oil will continue to drop as throughput declines. Eventually, in the not so distant future, the oil temperatures could become cold enough for ice to form in the pipeline during normal operations.

In 1989, with throughput peaking at 2.1 million barrels a day, it took oil approximately four and a half days to move 800 miles from Pump Station 1 to the terminal. Today, each barrel takes approximately 14 days to reach our terminal in Valdez. At 500,000 barrels per day, it will take the oil 18 days to travel the pipeline. At 300,000 barrels per day, it will take a month. Longer transit time increases risks, and during any winter shutdown water can settle and turn to ice, creating conditions that could block or damage valves, pumps, and other sensitive equipment on restart, potentially causing an extended interruption to our operation.

The challenges related to declining flow were made abundantly clear during an unscheduled winter shutdown we experienced in January. That event was a wake-up call for Alyeska, as it should be for Alaska and all Americans.

The shutdown started on January 8th, when an employee on routine rounds at Pump Station 1 discovered a leak contained in our booster pump building. Throughout the incident recovery, we experienced no serious injuries and no adverse impacts to the environment. However, we did have a leak and we needed to fix it rapidly. Our employees and contractors immediately started designing and engineering bypass piping to circumvent the leak site and allow us to restart.

While this design work was going on, the impacts of declining throughput were evident. Although lower throughput has impacted our operations for several years, it had never been as pressing and critical a factor as it was during this January event. Carefully weighing risks, we decided the most prudent course of action was to do an interim restart to slow temperature decline along the mainline, even though oil would continue leaking into the containment basin at Pump Station 1. This decision was driven by potential issues related to ice and wax buildup in the line, plus the fact that we had scraper pigs in the line that we needed to remove or capture before they became an impediment to a safe restart. It would have been a far greater risk to remain shut down.

Restarting helped warm the oil while the Pump Station 1 bypass was fabricated and assembled and allowed us to move the pig that was upstream of Pump Station 8 into a pig trap line at that pump station. Moving that pig off the mainline was critical. We were concerned about what would happen if that pig came up against concentrations of wax and ice. Without intervention, that pig could have pushed the ice and wax into equipment and disabled the line. If ice damaged our mainline pumps, we would risk shutting down the pipeline for weeks or even months.

When we were fully prepared to install the bypass piping at Pump Station 1, we shut down again and got the job done quickly and safely. We safely restarted after being shut down a combined 142 hours. During this event, the crude oil in the majority of the pipeline was between 29 and 40 degrees Fahrenheit. About 100 miles of the pipeline, located in interior Alaska, cooled to minimums between 29 and 30 degrees Fahrenheit. After restarting the line and restoring operations, we ran specially designed pigs through the line to reduce the risk of damage from our standard hard pig.

There are other serious challenges besides falling temperature associated with declining throughput. Some of these challenges are associated with what happens with the small amount of water contained within crude oil. For current throughputs of roughly 640,000 barrels a day, water typically travels along in the crude in small droplets. Once throughput drops below 500,000 barrels a day, the water is expected to separate out in a flowing layer at the bottom of the pipe. This will increase water concentrations, especially at low-lying points on the pipeline, and where the pipeline has upward slopes. During an extended TAPS winter shutdown or at low flow rates, the locations where water accumulates may freeze and impact the pipeline's ability to restart or maintain flow. Water buildup within TAPS could also create conditions conducive to ice formation within the flowing oil stream. We were concerned about this risk during our January shutdown. Assuming we have a 5-7 percent decline a year, we will drop below 500,000 barrels per day sometime around 2014 or 2015.

Engineering analysis and testing indicates that freezing of water in the oil during flowing conditions would be very likely if crude oil temperatures decrease below the freeze point. The operational impacts of ice formation in flowing conditions could include disabling mainline valves, accumulations of ice at tees, bends, valve bodies and pump strainers, and large accumulations of ice during pigging operations. The ice could damage relief valves, mainline pumps or other sensitive equipment.

Wax deposition and precipitation on pipe walls can become a problem in declining flow conditions. Crude oil includes paraffins, asphaltenes and other naturally occurring substances that are present in a liquid phase at higher temperatures and tend to drop out of the crude or deposit on the pipe wall as temperature drops. Wax can build up on the pipe walls, potentially creating an environment for corrosion to occur. Excessive accumulation of wax can also cause pressure differentials along the pipeline, resulting in less efficient oil movement. Wax precipitated and entrained within the crude oil stream can settle to the bottom of the pipe during pipeline shutdowns and at lower flow rates. This can create excessive accumulations in front of pipeline pigs.

A further potential operational issue associated with declining flow rates in Alaska is frost heave. TAPS was designed as a warm oil pipeline and buried in thawed and thaw stable frozen soil. In areas where the warm pipeline caused melting that would result in excessive settlement, the pipe was insulated, elevated above ground, and supported to keep the permafrost frozen. With declining TAPS throughput and associated declining temperature, the soils underlying the buried pipe will freeze. Should this occur, in certain soil conditions, ice lenses will form under the pipe which could cause differential pipe displacement. If we were to do nothing to intervene and heat the crude oil, we anticipate through engineering analysis that TAPS would face potential for initiation of the formation of problematic ice lenses under the pipe at a flow rate of approximately 350,000 barrels a day.

We are currently taking multiple actions to respond to declining throughput. We are constantly monitoring and adjusting our pigging program. We have increased our use of cleaning pigs to minimize the potential impact of wax accumulation on oil movement and pipeline integrity. As noted earlier, we adjusted our pigging after the January shutdown. We expect pigging to continue to challenge us as we move into the future and manage our way through further declining throughput.

We are also looking at ways to add heat to the line. This may include installing oil heating units at strategic locations to maintain operational crude oil temperatures. It could also include adding insulation to the pipe at some of the sites that are known to be the coldest. This could assist in minimizing the operations of heaters. We may also use some of our offline pump stations during winter operations to recycle crude oil to keep the temperatures up. Additionally, we need to analyze the capabilities of our instrument pigs at declining flow speeds.

These measures are not quick, they are not cheap, and they involve complex solutions to a complex set of problems.

During the January response at Pump Station 1, we found ourselves in new territory, driven by the very real risks of a cold-weather shutdown in the face of declining throughput. We knew it wasn't just TAPS that was threatened, but North Slope operations, Alaska's people, our economy, and the nation's energy security. If we were unable to supply crude to a refinery at North Pole, the heating oil supply for interior Alaska would be cut off; a life safety issue in interior Arctic Alaska. The work we did would normally take months to plan the project, obtain materials, complete required permitting, inform stakeholders, and ultimately, execute the work. We did it in days. We felt tremendous urgency to get the line back up safely and efficiently. All told, the response of our personnel, often in conditions of -20 to -30 Fahrenheit, was extraordinary by any means.

Our bottom line is simple: We need more oil in our pipeline. TAPS viability depends on political will for Alaska oil development. Our future depends on increasing safe and responsible production in Alaska. For this reason, we truly appreciate the committee's work on this issue.

Sincerely,

Thomas J. Barrett

cc: The Honorable Fred Upton, Chairman
Committee on Energy and Commerce

The Honorable Henry Waxman, Ranking Member
Committee on Energy and Commerce

Mr. SCALISE. Less than 2 years ago I got to go to Alaska and we went to Prudhoe Bay. We went to Section 1002 of ANWR, which is talked about a lot. As Senator Murkowski said, you know, this is something we still ought to pursue as well. You know, and these are areas that Section 1002 of ANWR is not the visuals that a lot of people see with, you know, fields and caribou running around. Section 1002 looks just like Prudhoe Bay and yet it is closed off from production and a vast amount of reserves there.

And we went to the pipeline where, you know, the threats from some of the same radicals who shut down exploration in Alaska for oil were saying don't build the pipeline. You will eliminate the caribou population. And we saw caribou everywhere around the pipeline. And they said I think the population has tripled because the caribou actually thrive in the environment because of the warmth of the pipeline. You know, you don't hear them revising those false statements. And you know, and yet they come out and just try to shut off more things.

So I don't know if, Dr. Goldsmith, if you want to address, you know, not only what they said but the lifespan—what happens if no new areas are opened up and the pipeline does in fact dry up? What kind of resource would our country be losing?

Mr. GOLDSMITH. Everybody has a different estimate of what the ultimate resources are on the North Slope but whoever estimates you accept, they are huge. And without the pipeline or some alternative means of getting that resource to market, we are losing a tremendous opportunity for the Nation.

Mr. SCALISE. Thanks. And final question, Mr. Lawrence. I know you talked about the use-it-or-lose-it provisions. We are experiencing that, too, in the Gulf where companies are not able to go and explore their leases because the Federal Government is not allowing them to, yet the clock keeps ticking. So it is like the referee is holding the ball and the clock is running and you are down by one, you just want the ball to take your shot and the ref is letting the clock run out. So I guess that is what you are experiencing with the 6-year delay you have had?

Mr. LAWRENCE. Certainly in Alaska, but remember, we are also very active in the Gulf of Mexico. We had just made 5 discoveries in a row and we would very much like to appraise those discoveries and bring those online and we are delayed in that. It is a very difficult challenge requiring the best of our technologies to be able to go from a lease to finding the prospect, to finding the drill site. And if you look at some of the major developments in the Gulf of Mexico that have had—it takes that lease period to be able to apply that technology appropriately to be able to develop the lease and produce the oil and gas.

Mr. SCALISE. Thank you for your comments. Thank you, Mr. Chairman. I yield back.

Mr. WHITFIELD. The gentleman from Texas, Mr. Olson, is recognized for 5 minutes.

Mr. OLSON. I thank the chair. I thank the witnesses for coming today for your testimony and your expertise. Home stretch. Last Member of Congress asking questions. My focus is going to be on three issues here. First of all, Shell's experience up there in the

Chukchi Seas, lessons learned from the Gulf of Mexico spill, and the impact on Alaska of the oil and gas industry on the economy.

And first of all, my question again for you, Mr. Lawrence, and Shell, I have many Shell employees in the district I represent and according to the testimony that many of you have put forth today and by the Alaska Delegation, Shell Oil Company again talks with EPA in February of 2006, so over 5 years ago, the start of a process that has yet to conclude. The EPA has twice issued permits and the EAB has twice remanded the permits citing inadequate analysis and support. My question for you, Mr. Lawrence, what specifically do you recommend that this Congress does to make EPA do its job?

Mr. LAWRENCE. I think what we are looking for is first, the EPA should provide clear, thorough, robust recommendations in a timely fashion such that we can make the requisite business decisions that we need to make to invest for oil and gas in this country. Now, very specifically what we are recommending is three things. The first is we need simple clarity on where we will measure these emissions relative to the major source. And we would recommend, again, that that would be placed as a definition at where the fence line is. And we could say that the most logical place for that would be where the communities are. So that would be number one.

The second thing that we would like to do is to say when we look at this clear definition of when it becomes a source. And that should not be very complicated. I would submit that something becomes a stationary source either when you start drilling—that would be the simplest way to do it—or you might say when you set anchors. Choose the simplest. Tell us what that is. That is what we will comply with and that is what we will move forward.

And the third is that provide a time frame when those decisions must be taken because as I say, when the time frame for the process is significantly longer than when the drilling window is open, that simply precludes you from being able to make progress. And we would recommend a 6-month time frame.

Mr. OLSON. How does this unpredictable regulatory environment impact the investment up in Alaska? To put it another way, based on your experience up in the Chukchi Sea, why would any investment company go up there and invest in oil and gas?

Mr. LAWRENCE. As the company that is responsible for having invested the $2.1 billion there, I think it is a great question. Every day, every month that goes by you have that money sitting there not being invested in other places that you could have invested those dollars. What that does, it really applies increased risk to where you are going to make those investments. And as we all know, in an environment of increased fiscal risk and increased uncertainty, that tends to drive investments elsewhere.

Mr. OLSON. Thank you for the answer. I will use the microphone this time. But I am going to have to cut this a little bit short so I just want to talk about the impact of these regulations on the Alaskan economy. And we have had testimony here from many of you. I heard as I was walking down, 90 percent of the revenue that Alaska generates comes from the oil and gas industry? And so I mean what are the impacts of these regulations on Alaska's budget? Without it, I mean, how can you maintain the quality of life for the Alaskan people? And I would like to ask that question, Mr. Sullivan, Mr. Glenn, and Ms.—let me make sure I get this right, the pronunciation, I want to apologize—Ms. Ahtuangaruak. All right.

Mr. SULLIVAN. Well, I will begin. We are very concerned about the TAPS throughput issue. We don't think that that needs to be the destiny of Alaska or the country to have continued throughput decline. And that was another reason I mentioned our governor, we have set out a goal for a million barrels through the TAPS in a decade, and we think it would be great if the Congress could support and make that a national priority. But if that continues or, as we had this winter, a shutdown, it would be devastating not only to the government funding, which is where we get the majority of our government funding, but also to the broader economy, as Dr. Goldsmith mentioned.

Mr. OLSON. Mr. Glenn?

Mr. GLENN. For the continued operation of the pipeline is the lifeblood of our State, and most immediately, it is the single factor that has improved the quality of life for the people in our region. We are talking about where it is a huge technical problem just to flush a toilet or have safe running water. It is these quality-of-life improvements that have come to these far-flung communities has only been due to the presence of a stable oil and gas industry in our region.

Mr. OLSON. Mr. Goldsmith, I would ask you to be quick here.

Mr. GOLDSMITH. I would just agree with what Mr. Sullivan and Mr. Glenn had said. Oil revenues are 90 percent of the total and without them I don't know how we would pay for education, health, other basic services throughout the State.

Mr. OLSON. Thank you, sir. And finally, last but certainly not least, Mayor Ahtuangaruak.

Ms. AHTUANGARUAK. Thank you. Shutting down the TAPS would definitely hurt many people but it should not be at the cost of the health of the people that are around the areas of oil and gas development.

Mr. OLSON. Thank you, ma'am. I thank the witnesses and thank the chair.

Mr. WHITFIELD. Well, I also want to thank the witnesses. We appreciate you being here. I know many of you came from very long distances and your testimony was really important as we consider this discussion draft introduced by Mr. Gardner. And with that this——

Mr. RUSH. Mr. Chairman, I would like to submit for the record a Rule 2 letter signed by all the minority members of the subcommittee which requests——

Mr. WHITFIELD. Is it Rule 2?

Mr. RUSH. Rule 11. Sorry, Rule 11 letter signed by all the members of the minority that requests an additional subcommittee hearing with the EPA representatives before the subcommittee markup on this bill.

Mr. WHITFIELD. Well, I think the letter has been given to staff, but thank you very much. We will certainly take it into consideration.

[The information follows:]

FRED UPTON, MICHIGAN
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA
RANKING MEMBER

ONE HUNDRED TWELFTH CONGRESS
Congreſs of the United States
House of Repreſentatives
COMMITTEE ON ENERGY AND COMMERCE
2125 Rayburn House Office Building
Washington, DC 20515–6115

Majority (202) 225-2927
Minority (202) 225-3641

April 13, 2011

The Honorable Ed Whitfield
Chairman
Subcommittee on Energy and Power
House Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Whitfield:

Pursuant to clause 2(j)(1) of rule XI of the Rules of the House of Representatives, we are writing to request that at least one additional day of hearings be conducted on the subject of today's hearing on draft legislation to amend section 328 of the Clean Air Act. We further request that this hearing be scheduled before the Subcommittee marks up legislation on this subject.

In particular, we believe that the Subcommittee should hear from the U.S. Environmental Protection Agency in order to fully understand the effects of this legislation. Since EPA is responsible for implementing the Clean Air Act and has deep expertise in the law and in the regulated activities, it only makes sense to hear from the agency prior to marking up legislation. Other relevant witnesses would also provide value to the Committee's examination of this issue.

Last week, Ranking Members Henry Waxman and Bobby L. Rush asked that an additional legislative hearing be planned if today's hearing moved forward without EPA. Yesterday, Ranking Member Waxman reiterated this request. There has not been a response to these requests. That is why we are invoking our right under rule XI to request such a hearing.

The Honorable Ed Whitfield
April 13, 2011
Page 2

We look forward to setting a mutually acceptable time and place for the additional hearing to garner testimony from witnesses that we have selected, and we thank you for your consideration of our request.

Sincerely,

Henry A. Waxman

Bobby L. Rush

Lois Capps

Edward J. Markey

Eliot L. Engel

Jim Matheson

Mike Doyle

cc: The Honorable Fred Upton
Chairman
Committee on Energy and Commerce

Mr. WHITFIELD. And I would say once again that we did invite EPA, and the EPA administrator was on the Hill today. But we have got the letter and we are taking it under consideration and we will be back in touch with you quickly.

With that, the hearing is concluded, and there will be 10 days for additional materials to be entered into the record. Thank you very much.

[Whereupon, at 12:47 p.m., the subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

Statement of Energy and Commerce Committee Chairman Fred Upton
Energy and Power Subcommittee Hearing on the American Energy Initiative Day 4: Focus on the Discussion Draft of the Jobs and Energy Permitting Act
April 13, 2011
(As Submitted for the Record)

The American people face rising gas prices, stubbornly high unemployment, and a growing deficit. Meanwhile, the state of Alaska is ready, willing, and able to do its part in addressing all three, if only the federal government would allow it. That is what the discussion draft of the "Jobs and Energy Permitting Act of 2011" is all about – getting government out of the way so Americans can benefit from the resources available to us.

This is the fourth segment of our multi-day hearing on the American Energy Initiative. Today's focus is on a proposal to ease permitting delays and other federal impediments that are preventing offshore leases in Alaska from moving forward. While the permitting delays off the Alaskan coast have drawn a great deal of attention, this proposal would promote offshore production elsewhere as well.

Mr. Gardner released the Jobs and Energy Permitting Act as a discussion draft, an approach we have used a number of times this year to promote transparency and produce stronger legislation. Based on what we learn from today's hearing, as well as constructive comments from others, we hope to refine the Jobs and Energy Permitting Act into a bill that will finally tear down some of the bureaucratic barriers to American energy development and help turn the tide on rising energy costs.

Just consider the benefits that could come from this simple proposal. Beyond producing energy and generating billions in federal, state, and local revenues, Alaskan offshore production is estimated to create between 40,000 and 50,000 jobs. And if offshore Alaskan oil is added to our other domestic energy production, it is enough to reduce our dependence on foreign oil by an estimated one million barrels, which would substantially increase our energy independence and help contain future price spikes.

In other words, Alaskan offshore production means more energy, more revenues, and more jobs. This should be a no-brainer. Yet critics continue to object, obstruct, and delay.

It is worth noting that increased Alaskan oil production is not a controversy in Alaska. It enjoys strong bipartisan support among state officials and the Alaskan delegation here in Washington. We welcome that delegation here today to share their views about what is best for their state and for our national energy strategy as a whole.

I look forward to today's discussion as we kick off our Jobs and Energy Permitting Act as the next addition to the American Energy Initiative.

Statement of Congressman Gene Green for the Record
Subcommittee on Energy and Power
"The Jobs and Energy Permitting Act of 2011"
April 13, 2011

This is an issue that has been on my radar for a while now and I hope that we can come to resolution on this.

Representing a heavily industrialized area that is naturally sensitive to air quality issues, I appreciate how the EPA's enactment of Clean Air Act provisions has positively attributed to our goal of cleaner air.

However, when I hear that in the five years since Shell first sought to explore in Alaska, Shell has drilled over 400 exploration wells around the world and they still do not have their permit for one single exploration well, something is clearly wrong with the process.

I have remained hopeful that the barriers to exploring in Alaska's Outer Continental Shelf would be addressed but it seems that we continue to find ourselves in a place where the permit will perpetually volley between the producer, EPA, and the Environmental Appeals Board with no movement towards a final decision.

The Jobs and Energy Permitting Act would rectify several of these process questions so that we can safely and responsibly produce our natural resources in the Arctic Ocean.

I have long been a supporter of safe and responsible drilling on the Outer Continental Shelf as these resources are a vital source of energy for the U.S.

With skyrocketing fuel costs, it is imperative for the U.S. to diversify our energy sources by exploring this area; this bill is the first step in this process.

[DISCUSSION DRAFT]

112TH CONGRESS
1ST SESSION

H. R. ____

To amend the Clean Air Act regarding air pollution from Outer Continental Shelf activities.

IN THE HOUSE OF REPRESENTATIVES

M__. ____________ introduced the following bill; which was referred to the Committee on ______________________

A BILL

To amend the Clean Air Act regarding air pollution from Outer Continental Shelf activities.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Jobs and Energy Permitting Act of 2011".

SEC. 2. AIR QUALITY MEASUREMENT.

Section 328(a)(1) of the Clean Air Act (42 U.S.C. 7627(a)(1)) is amended by inserting before the period at the end of the second sentence the following: ", except that any air quality impact of any OCS source shall be measured and determined solely with respect to the impacts at an onshore location in the corresponding onshore area''.

SEC. 3. OCS SOURCE.

Section 328(a)(4)(C) of the Clean Air Act (42 U.S.C. 7627(a)(4)(C)) is amended in the matter following clause (iii) by striking ''shall be considered direct emissions from the OCS source'' and inserting ''shall be considered direct emissions from the OCS source but shall not be subject to any emission control requirement applicable to the source under subpart 1 of part C of title I of this Act. For platform and drill ship exploration, an OCS source is established at the point in time when drilling activity commences at a location and ceases to exist when drilling activity ends at such location.''.

SEC. 4. PERMIT APPLICATION.

Section 328 of the Clean Air Act (42 U.S.C. 7627) is amended by adding at the end thereof the following:

''(d) PERMIT APPLICATION.—In the case of a completed application for a permit under this Act for an OCS source—

''(1) final agency action shall be taken not later than 6 months after the date of filing such completed application;

"(2) such final agency action shall be considered to be nationally applicable under section 307(b); and

"(3) judicial review of such final agency action shall be available only in accordance with such section 307(b) without additional administrative review or adjudication, except for a petition for reconsideration filed by the applicant pursuant to section 307(d)(7)(B).".

Subcommittee on Energy and Power
Hearing on the Jobs and Energy Permitting Act
April 13, 2011

Shell Dave Lawrence Answers to
Questions from the Honorable Henry Waxman

Q.1. In addition to the Clean Air Act permits, how many other permits do you still need to obtain prior to starting drilling on your proposed exploration wells? When do you expect to receive each of those permits?

A.1. Shell needs about 35 major permits/authorizations from federal and state agencies to execute the full 2012 exploration drilling program in Alaska's Outer Continental Shelf (OCS). We anticipate, based on past experience, that most of these permits will be received in a timely manner that allows safe mobilization of the people, equipment and vessels to do the work. The timing for delivery of several key federal permits is less certain, because the responsible agencies have not provided clear timelines.

We are hopeful that these federal permits will be delivered in a timely manner. EPA Region 10 advises that the air permits will be issued in September or October. The Department of the Interior (DOI) indicates that it will process our Exploration Plans (EPs) and associated Applications for Permits to Drill (APDs) as expeditiously as possible. The National Marine Fisheries Service (NMFS) is responsible for issuing Incidental Harassment Authorizations (IHAs), but has not provided a clear timetable.

Q. 2. As of December 2010 when EAB remanded the air permits, what steps remained to be taken on each of the necessary permits other than the air permits, and when would each of those steps likely have been completed? What assurance did you have that you would have obtained each of these permits in time to allow your planned 2011 exploration program to proceed?

A.2. As of December 2010 when EAB remanded the air permits, Shell had submitted or was preparing to re-resubmit applications for the required permits needed to execute the 2011 Beaufort Sea exploration program. Shell believed these permits could be delivered in a timely manner for the 2011 drilling season, because (1) the President had public stated support for exploration in Alaska's OCS; and (2) Shell had five years of experience applying for and receiving an array of permits to do Alaska OCS seismic and shallow hazard surveys and exploration drilling (although drilling not executed). The permits were expected to be delivered in time for 2011 drilling.

Q. 3 If you began exploration as proposed this year, when would full scale production commence?

A.3. Exploration and appraisal, which is critical to informing development decisions, is likely a multi-year process. In a predictable and efficient regulatory environment, production could begin as early as ten to fifteen years after this exploration and appraisal phase.

Q. 4. At the hearing, you were asked: "do you think it is fair to allow only oil companies and no one else to request administrative reconsideration of a permit?" In your oral response to this question, you stated that you comply with regulatory requirements, you welcome input, you consult with other parties, and you support allowing comments to EPA on a permit. You did not address the question of whether it is fair to provide a procedural right of administrative appeal only to the permit applicant, and not to any other party.

Do you think it is fair to allow only the permit applicant and no other interested party to request administrative reconsideration of a permit decision by EPA? If you answer yes, please explain how your position comports with our longstanding traditions of providing equal rights of appeal to all parties to a judicial matter.

A. 4. This provision in the discussion draft bill is, as I understand it, an effort to ensure timely delivery of air permits – a goal Shell firmly supports. Should Congress determine that changes to the reconsideration process are appropriate to ensure timely delivery of air permits, there could well be other approaches, e.g., eliminating the agency reconsideration step for all parties; or allowing all parties to seek reconsideration as long as the issued air permit is effective for use and is not stayed during the reconsideration process.

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